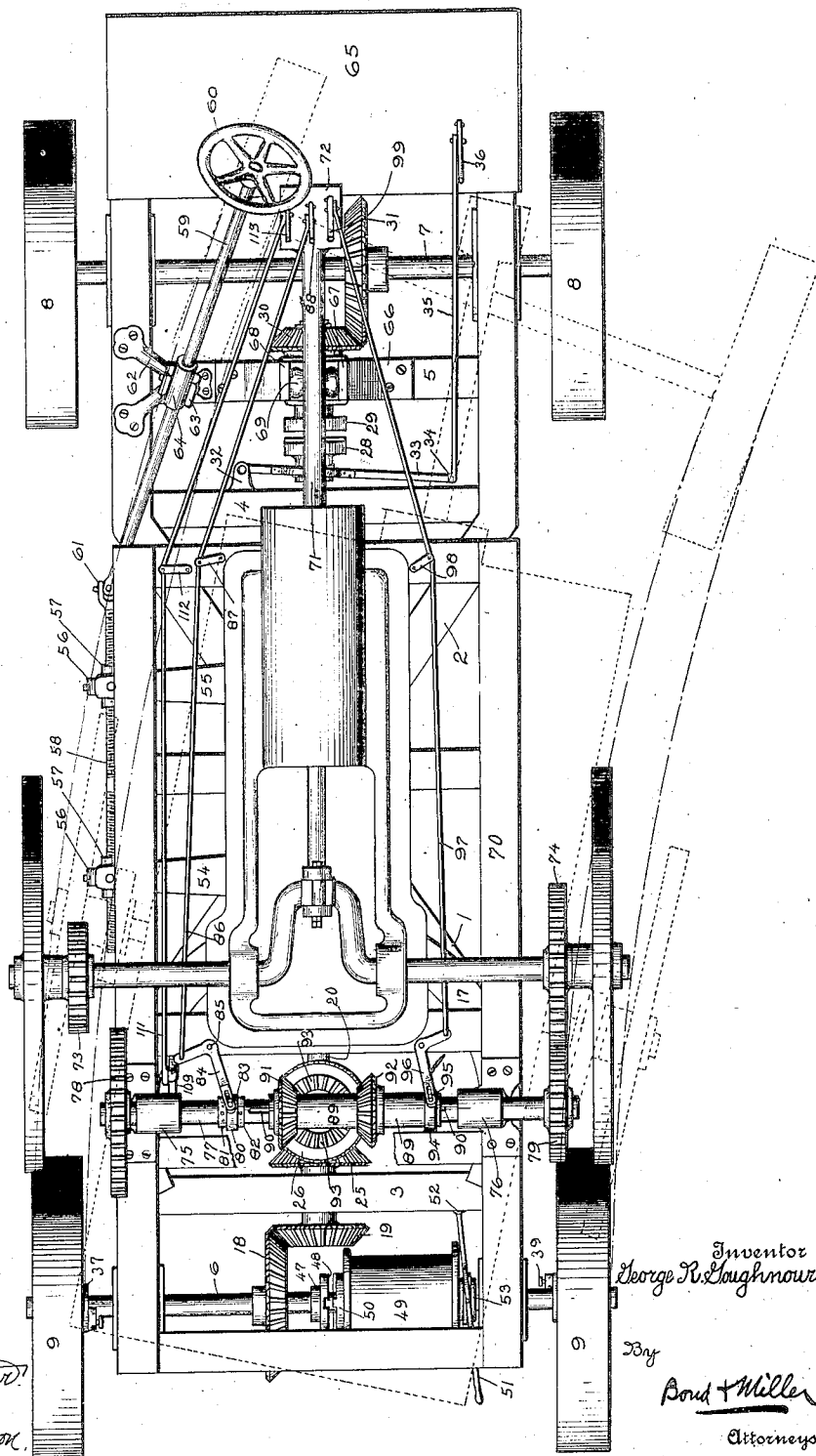


G. R. GOUGHNOUR.
TRACTION ENGINE.
APPLICATION FILED SEPT. 17, 1908.

Patented Mar. 2, 1909.
3 SHEETS—SHEET 1.

914,137.

Fig. 1.



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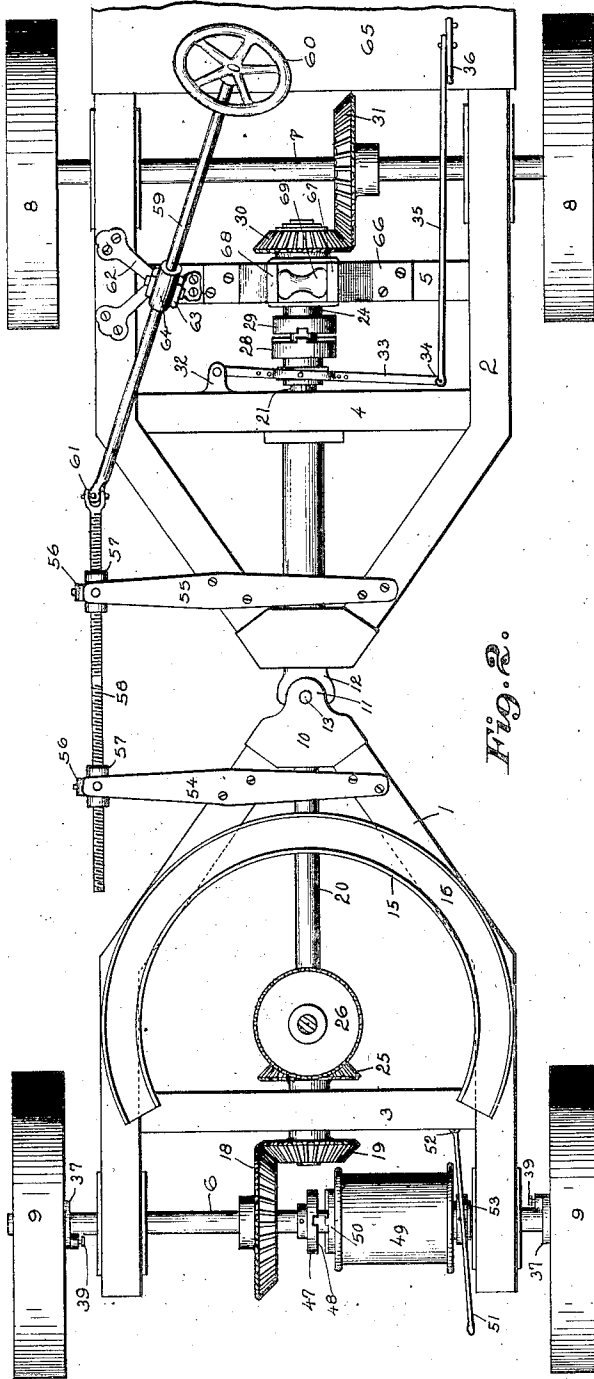


Fig. 2.

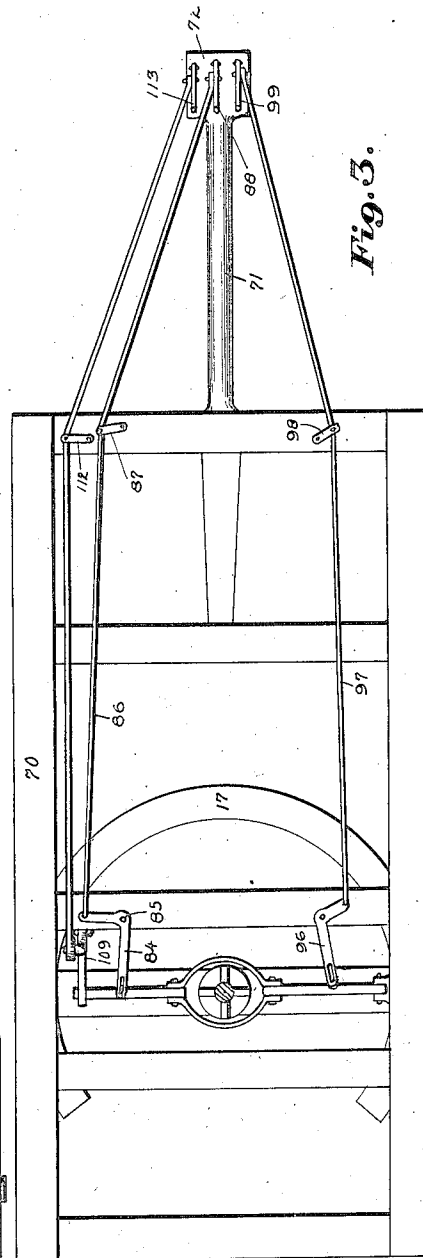


Fig. 3.

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3 SHEETS—SHEET 3.

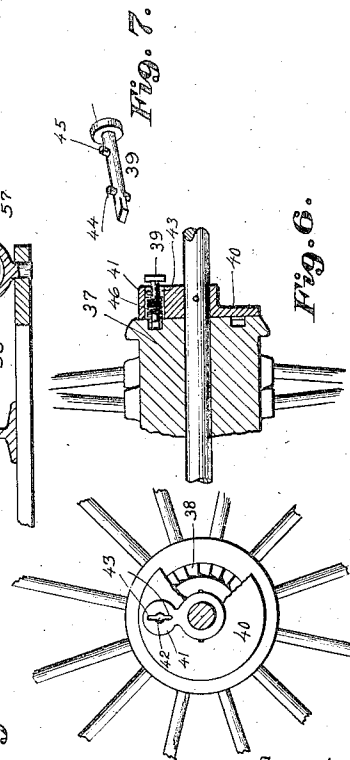
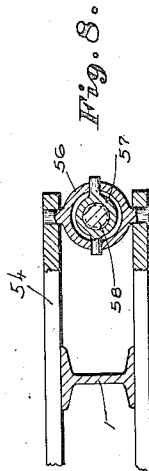
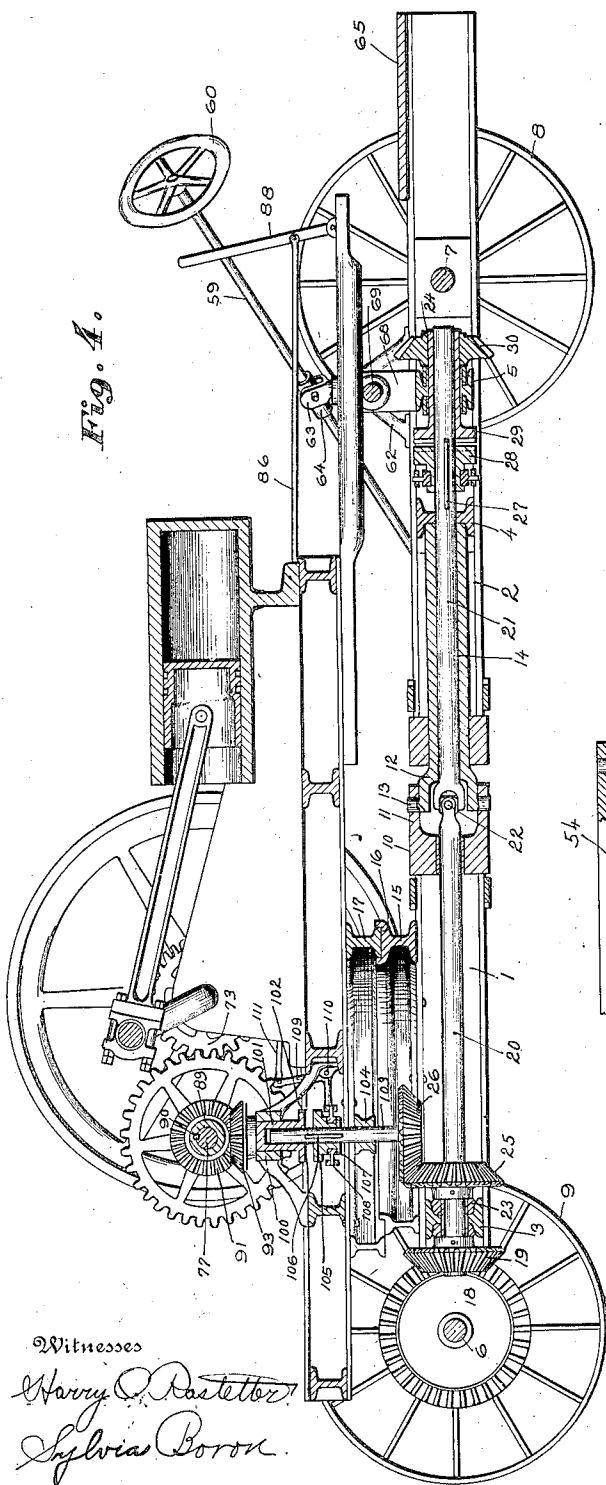


Fig. 5.

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UNITED STATES PATENT OFFICE.

GEORGE R. GOUGHNOUR, OF CANTON, OHIO.

TRACTION-ENGINE.

No. 914,137.

Specification of Letters Patent.

Patented March 2, 1909.

Application filed September 17, 1908. Serial No. 453,543.

To all whom it may concern:

Be it known that I, GEORGE R. GOUGHNOUR, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Traction-Engine, of which the following is a specification.

My invention relates to improvements in traction engines designed for heavy hauling and especially to such an invention in which gasoline is used for supplying the motive power, and the objects of my improvement are, first, to provide a substantial running gear which will be convenient in operation and at the same time will readily permit the application of power to both the front and the rear wheels and which, together with the remaining mechanism embodied in the construction set forth in the drawings will provide means for hauling excessively heavy loads in places where the draft is unusually heavy and at the same time do away with much of the complicated and undesirable construction of those analogous devices now employed for the same purpose. I attain these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 is a top view of the complete traction engine, also showing in dotted lines the relative arrangement of parts in turning the engine on the roads. Fig. 2 is a top view of the running gear showing also the relation and connection of the main driving shaft to the other parts of the device. Fig. 3 is a top view of the upper frame with some of the mechanism-controlling devices illustrated. Fig. 4 is a longitudinal vertical section through the traction engine disclosing the relation of the various parts of the driving mechanism. Fig. 5 is a detached view of one of the front hubs and disks, a portion of said disk being broken away to disclose the hub construction. Fig. 6 is a vertical section through the said hub showing the ratchet pin in engagement with one of the notches in the said hub. Fig. 7 is a perspective view of one of the ratchet pins. Fig. 8 is a sectional view through one of the pairs of lateral arms and screw threaded sockets used in connection with the steering device.

Throughout the several views similar numerals of reference indicate similar parts.

The forward and rear frames 1 and 2 respectively are preferably constructed of metal of the "I" beam pattern and have the cross pieces 3, and 4 and 5 for the purpose of

providing bearings for the main driving shaft. At the forward end of the frame 1 and at the rear end of the frame 2 respectively, the front live axle 6 and the rear live axle 7 are journaled. The rear driving wheels 8 are fixedly mounted upon the live axle 7 while the front driving wheels 9 are rotatably mounted upon the axle 6 and have ratchet connection therewith as hereinafter more fully described. The frames 1 and 2 taper toward their point of pivotal connection and the said pivotal connection consists of a casting 10 provided with a rearwardly extending yoke portion 11 within which is arranged the casting 12 having the projections 13 adapted to engage suitable apertures in the upper and lower sides of the yoke 11. The casting 12 extends through the rear frame to the cross piece 4 where it terminates and it is also drilled axially throughout its length at 14 for the accommodation of the main driving shaft as hereinafter described. Upon the front frame is mounted a circular track-like bearing 15 provided with a groove 16 in its upper surface adapted to receive a circular bearing track 17 mounted upon the lower side of the upper frame.

Upon the front axle 6 is fixedly mounted the beveled gear 18, which meshes with the beveled gear 19 fixedly mounted upon the extreme front end of the driving shaft. The main driving shaft consists of two portions, the forward and the rear portions 20 and 21 respectively which are connected to each other by means of a universal joint at the point 22 in the axis of the pivotal connection between the front and rear frames 1 and 2. The forward portion 20 is mounted in the bearing 23 arranged on the cross piece 3 and also in a box in the casting 10. The rear portion 21 is journaled in the casting 12 and also in a sleeve 24, which in turn is rotatably mounted within a bearing on the cross piece 5 of the frame 2. Besides the gear 19 the forward shaft is provided with the beveled gear 25 which is fixedly mounted upon said shaft and meshes with the beveled gear 26 for the purpose hereinafter more fully disclosed. The rear shaft 21 is provided with a feather key 27 which secures the movable clutch head 28 against rotation upon the said shaft while permitting sliding movement of the said head upon the said shaft.

The forward end of the sleeve 24 is provided with what may be termed a relatively

stationary clutch head 29 adapted to be engaged by the sliding clutch head 28 when the same is moved to its rearward position. The beveled gear 30 is also fixedly mounted upon the sleeve 24 and meshes with the beveled gear 31, which is fixedly mounted upon the rear live axle 7 and is intended to produce rotation of the axle 7 when the sleeve 24 is caused to rotate. The detailed construction of the clutch heads 28 and 29 is immaterial except that the clutch should be a positive one and such clutch is shown in the drawings.

Upon the cross piece 4 is arranged the bracket 32 to which is pivotally attached the clutch operating lever 33, which lever is provided with a yoke portion encircling the clutch head and pivoted thereto in the usual well known manner and to which lever at the point 34 is pivotally attached the connecting rod 35 which extends rearwardly and has pivotal connection with the hand lever 36 whereby the clutch head 28 may be thrown into engagement with the head 29 for the purpose of rotating the gear 30 with the shaft 21 when so desired.

The front wheels 9 are provided with substantial hubs 37 which are provided on their inner faces with an annular series of notches 38, the said series being arranged concentrically with the axle 6 and in accordance with a well known form of ratchet construction wherein one side of the notch is deeper than the other producing beveled "teeth" adapted for engagement with the clutch pin 39 when the said pin is moved with the axle in the direction to advance the traction engine forward and adapted to allow the said pin to ride up the inclined faces of said notches and thus produce no rotation of the hubs 37 when the axle 6 is rotated in the direction which would normally reverse the movement of the traction engine. Bearing against the inner faces of the hubs 37 are the disks 40 which are fixedly mounted upon the live axle 6 and are provided with an enlarged portion forming the pin and spring housing 41. The said housing is arranged immediately opposite the annular series of notches and upon the side next to the hub is open to permit the pin 39 to engage the said notches while at the opposite end of the housing an opening 42 equal to the diameter of the pin 39 and also radial slot like extensions of said opening 43 are provided. The pin 39 is provided with a head portion as shown and also with the spring-engaging lugs 44 and 45 between which is arranged the coil spring 46. The arrangement of the device is clearly illustrated in Figs. 5, 6 and 7 where it will be seen that the pin and spring are located within the housing of the disk 40 with the inner end of the pin engaging the notches 38. The one end of the coil spring engaging the lugs 44 and the other end bearing against the partially closed end of the housing will force the

pin against the faces of the notches while the lug 45 is located within one of the slots 43. If now the head of the pin be drawn away from the disk 40 so as to disengage the point of the pin from the notches and the said pin be given a quarter turn the lug 45, having been lifted out of the slot 43, will bear against the outside of the housing 40 adjacent the aperture 42 and will prevent the pin from again coming into engagement with the notches 38 until such time as the said pin is again turned so that the lug 45 may enter the slot 43, all for the purpose hereinafter more fully disclosed.

Upon the front live axle 6 is fixedly mounted the disk 47 provided with a radially notched face 48. Rotatably and slidably mounted upon the said front axle is the drum 49 provided at the end adjacent the disk 47 with the integral clutch member 50 having radially disposed ribs adapted for engagement with the notches in the face of the disk 47, the disk 47 and the clutch member 50 being adapted to co-act to cause the drum 49 to rotate with the axle 6 when the drum 49 is moved along the axle 6 until the said clutch member and disk engage each other. For the purpose of controlling the sliding movement of the drum 49 along the axle 6 the lever 51 is provided which is pivoted to the cross piece 3 at the point 52 and also has pivotal connection with the loose collar 53 upon a reduced portion of the drum 49 in accordance with the method commonly employed in the control of rotary clutch members. It will be understood that by grasping the lever 51 with the hand and moving it to the right or the left the drum 49 will be moved along the axle 6 and the disk 47 and the clutch member 50 caused to separate from or engage each other as desired by the operator.

Fixedly attached to the forward and rear frames are the laterally extending arms 54 and 55, which consist of upper and lower members as more clearly illustrated in Fig. 8 and between the upper and lower members of each arm is pivotally mounted the yoke 56 which in turn carries the transversely pivoted knuckle sleeve 57, which is internally screw threaded for the accommodation of the screw threaded spacing rod 58. The knuckle sleeves upon the two arms are right and left threaded with respect to each other and the spacing rod 58 is likewise right and left threaded so that when the rod 58 is rotated in one direction the ends of the arms 54 and 55 will be brought closer together whereas if the rod 58 is rotated in the opposite direction the ends of the arms 54 and 55 will be farther separated from each other. It is obvious that the result of the relative movement between the arms 54 and 55 will be to give pivotal movement as between the forward and rear frames 1 and 2

and thus provide means for guiding the traction engine.

For the purpose of controlling the rotation of the rod 58 the steering rod 59 is provided.

5 The steering wheel 60 is fixedly mounted upon the upper end of said rod and the universal joint 61 connects the other end of the steering rod with the end of the spacing rod 58. Upon the frame 2 is mounted a bracket 10 62 within which is vertically pivoted a yoke 63 which carries the transversely pivoted sleeve 64 through which runs the steering rod 59. The said steering rod 59, it should be understood, is freely rotatable within the sleeve 64 and also is free to slide longitudinally within the said sleeve for the purpose of permitting adjustment of the said steering rod during the operation of the traction engine over uneven roads.

20 Upon the rearward extension of the rear frame 2 is arranged the platform 65 upon which the operator of the traction engine may stand and from which point the steering wheel as well as the lever 36 and other levers 25 to be hereafter described are readily accessible.

Mounted upon the cross piece 5 of the frame 2 is a roller support 66, provided with two upwardly extending yoke pieces 67 and 30 68 between which is rotatably mounted the transversely disposed roller 69, said roller being of less diameter at its central portion than at its ends as shown in the drawing, and for the purpose hereafter described.

35 The upper frame 70 is of the general form illustrated in Fig. 3 and is constructed of "I" beams and channel iron and upon the lower side near its forward end is provided with the circular bearing track 17 adapted to engage the groove 16 in the upper surface of the bearing 15 upon the lower frame. At the rear end of the upper frame is an extension or tail piece 71 which is substantially round in cross section and is provided at its rear extremity with the lever-base portion 40 72. The said upper frame is adapted to be placed upon the forward and rear frames 1 and 2 with the bearing track 17 mounted upon the bearing 15 and the tail piece 71 upon the roller 69, which roller is reduced in diameter at its central portion for the purpose of more securely holding the tail piece in position upon it, and if desired a reversed U shaped band, not shown in the drawings, may extend from the yoke piece 50 67 over the top of the tail piece 71 and to the yoke piece 68 thus providing additional means for holding the said tail piece against displacement.

60 Upon the upper frame is mounted the source of power for driving the traction engine, preferably a gasoline engine as illustrated in the drawings. The said engine should be so disposed that its crank shaft 65 will extend across the upper frame as illus-

trated and the said crank shaft should be provided with the gears 73 and 74 at its opposite ends. Fixedly mounted upon the upper frame are the counter-shaft supports 75 and 76 provided with boxes in which the counter-shaft 77 is journaled. The said counter-shaft is provided at each end with a gear, the gear 78 adapted to mesh with the gear 73 and the gear 79 adapted to mesh with the gear 74 when the counter-shaft 77 is 75 slidably adjusted to bring the respective pairs of gears into engagement with each other. The gear 73 is spaced from the gear 74 a certain distance and the length of the counter-shaft 77 is such that the distance 80 between the gears 78 and 79 is sufficiently less than the distance between the gears 73 and 74 so that by slidable adjustment of the counter-shaft 77 the gears 78 and 79 may be 85 thrown entirely out of engagement with the gears 73 and 74 or the gears 78 and 73 or the gears 79 and 74 may be thrown into engagement as desired. The gear 73 is of less diameter than the gear 78 and the gear 74 is of greater diameter than the gear 79 so that by 90 the slidable adjustment of the counter-shaft 77 greater power with less speed or less power with greater speed may be communicated to the counter-shaft from the crank shaft of the engine. 95

Loosely mounted upon the counter-shaft 77 is the collar 80 held in place against longitudinal movement on said shaft by the stationary collars 81 and 82. The collar 80 is provided with pins, 83, which are engaged 100 by the yoke portion of a bell crank lever 84, which is pivoted to the upper frame at 85. Pivotaly attached to the other end of the bell crank lever is the connecting rod 86 which extends rearwardly and is guided by a pivoted link 87 to the lever 88, which lever is 105 mounted upon the lever-base portion 72 of the tail piece 71. It will be understood that the counter-shaft 77 is freely rotatable within the collar 80 and that by manipulation of the lever 88 the bell crank 84 will be so operated as to move the shaft 77 longitudinally within its bearings so as to throw the same out of gear with the engine or to throw either the 110 gears 73 and 78 or 74 and 79 into engagement with each other as may be desired. 115

The sleeve 89 is slidably mounted upon the counter-shaft 77 and held against rotation on the same by means of the feather key 90 which extends throughout the length of the 120 said sleeve and for a short distance beyond the same. Upon the sleeve 89 are fixedly mounted the beveled gears 91 and 92 adapted for engagement with the beveled gear 93 to be hereinafter more fully described. The 125 collar 94 is rotatably mounted upon the sleeve 89 but held against longitudinal displacement by means similar to that in the case of the collar 80 just described. Pins 95 are provided upon the collar 94 which pins 130

are engaged by the yoke portion of the bell crank lever 96 which is pivotally attached to the upper frame. From the other side of the bell crank lever the connecting rod 97
5 guided by the pivoted link 98 leads to the lever 99 mounted upon the lever-base portion 72 and pivotal connection is provided with the rod 97 and the lever 99 so that by manipulation of the lever 99 the bell crank lever
10 96 may be caused to move the sleeve 89 longitudinally in either direction upon the counter-shaft 77. The beveled gears 91 and 92 are so spaced from each other that either one or the other of said gears will be in engagement with the gear 93 and so that both
15 gears can never be in engagement with the said gear 93 at the same time. It will be obvious that while the counter-shaft 77 is rotating in a given direction manipulation of the lever 99 will throw either the gear 91 or
20 92 into engagement with the gear 93 and that the direction of rotation of the gear 93 will depend upon which of the two gears 91 or 92 is in engagement with it.

25 In the axis of the circular bearing track 17 and of the bearing 15, and above the plane of the upper frame is the stationary supporting collar 100 which forms a bearing for the hollow stud upon which the gear 93 is mounted.
30 This collar is supported from the cross pieces in the upper frame by means of integral brackets as most clearly illustrated in Fig. 4. The gear 93 is mounted upon or formed integrally with the hollow stud 101, which has a friction clutch face 102. Within
35 the hollow portion of the stud 101 is journaled the shaft 103 which also has a bearing at 104 and is provided at its lower end with the fixedly attached gear 26 meshing with the gear 25 as before described. The lower
40 clutch member 105 is slidably mounted upon the shaft 103 and is held against rotation on said shaft by a feather key, 106. A rotatable collar, 107, provided with pins, 108,
45 is arranged upon the lower clutch member and the bell crank lever 109 is provided with a yoke portion at one end which is in engagement with the said pins. The bell crank lever 109 is pivoted to the upper frame at
50 the point 110 and at its other end has pivotal connection with the connecting rod 111, which extends rearwardly over the top of the upper frame, and is guided by the pivoted link 112 to the lever 113 mounted upon the
55 lever-base portion 72 and with which lever it has pivotal connection so that manipulation of the said lever will move the connecting rod 111 longitudinally, thus operating the bell crank lever 109 and bringing the
60 lower clutch member 105 into engagement with the clutch head 102. It will be understood that while the counter-shaft 77 is rotating and one of the gears upon said shaft is in engagement with the gear 93 so
65 as to cause the said gear together with the

hollow stud 101 to rotate the lower clutch member 105 may be thrown into engagement with the clutch head 102 thus producing rotation of the shaft 103 and the gear 26.

A device of the kind herein described being 70 provided, the operation of the same is as follows: The engine having been started power may be communicated to the counter-shaft 77 through the intermediate gears and by manipulation of the lever 99 the appropriate gear upon the sleeve 89 may be thrown
75 into engagement with the gear 93. Let it be supposed that the direction of rotation of the gear 93 is appropriate for the forward movement of the traction engine, the lever 36
80 should be manipulated to throw the clutch heads 28 and 29 into engagement and the lever 113 should be manipulated to throw the lower clutch member 105 into engagement with the clutch head 102. This will
85 produce rotation of the gear 26 which will be communicated to the gear 25 and produce rotation of the main driving shaft 20 and 21, rotating the gears 19 and 30 at the extreme ends of said shaft and communicating power
90 to all four of the driving wheels. This will produce a forward movement of the traction engine whereupon the same may be guided in the said forward movement by means of
95 appropriate manipulation of the steering wheel 60 causing pivotal movement between the forward and rear frames 1 and 2. In the pivotal movement of the forward and rear frames the bearing track 17 will be
100 moved in a circular direction within the groove 16 of the track-like bearing 15, and the pivotal point between the frames 1 and 2 being away from the axis of the circular bearing track 17 a sliding movement will
105 take place as between the tail piece 71 and the rear frame 2, which sliding movement will be accommodated by the rotation of the roller 69, the said tail piece 71 being free to move longitudinally as well as to a certain
110 extent transversely or obliquely upon said roller.

One of the most important features is the use of the drum 49 in cases where excessively heavy draft is required or where it is desirable to block the traction engine against
115 movement and use the said drum 49 as a winch in logging or moving heavy objects. In using the drum 49 the lever 36 should be manipulated to disengage the clutch heads 28 and 29 the lever 88 should be manipulated
120 to slide the counter-shaft 77 so as to engage the gear 73 with the gear 78 producing increase of power at a loss of speed and the lever 99 should be manipulated so as to throw the proper gear into engagement with
125 the gear 93 so as to produce a rotation of said gear reversed from its usual direction. The lower clutch member 105 being in engagement with the clutch head 102 a reverse rotation of the front live axle 6 will be produced
130

through the operation of the intermediate gears. The live axle 6 rotating in reverse direction will cause the clutch pins 39 to ride up and slip over the beveled notches 38, thus producing no rotation of the front driving wheels. The lever 5f may then be thrown to bring the clutch member 50 into engagement with the disk 47 producing rotation of the drum 49. One end of a cable or rope having been attached to the object to be moved or having been fastened to a stationary object in case the traction engine itself is to be moved, the other end of the cable may be fastened to the drum and the said cable wound upon the drum 49, in the manner well known in the art of using similar devices whereupon the drum 49 will prove a very powerful and efficient winch.

It should be understood that although the drawings do not show a differential gear upon the rear axle such gear of any well known pattern should be used to produce a more efficient device. Such gears are in common use upon similar constructions and such gear is not herein shown or claimed.

I claim:—

1. The herein described traction engine comprising forward and rear frames, bearings arranged on said frames, forward and rear live axles journaled in said bearings, driving wheels mounted upon said axles, said frames pivoted together for the purpose of steering, means for supplying power to said live axles, means for changing the pivotal adjustment of the two frames with reference to each other and for holding the said frames in said adjustment, means for disconnecting said power from the rear axle, means for reversing the direction of rotation of the front axle, ratchet connection between said front axle and the driving wheels mounted thereon, a drum mounted upon said front axle and a clutch adapted to lock the said drum upon the said axle.

2. The herein described traction engine comprising forward and rear frames, bearings arranged on said frames, forward and rear live axles journaled in the bearings, driving wheels mounted upon said axles, the said frames pivoted together for the purpose of steering, the forward frame provided with a circular, track-like bearing, the rear frame provided with a horizontally, transversely disposed roller, an upper frame provided with a circular bearing track adapted to engage the circular track-like bearing upon the forward frame and with an extension or tail

piece adapted to bear upon said roller on the rear frame, the axis of the pivotal connection between said forward and rear frames being at a point between the axis of the circular bearing upon the forward and upper frames and the said roller on the rear frame.

3. The herein described traction engine comprising forward and rear frames, bearings mounted on said frames, forward and rear live axles journaled in said bearings, driving wheels mounted upon said axles the said frames pivoted together substantially mid-way between the axles, a main driving shaft extending from the front axle to the rear axle and having operative connection with said axles, the said main driving shaft composed of forward and rear portions, the said portions being connected together by means of a universal joint, said joint being in the axis of the pivotal connection between said forward and rear frames.

4. The herein described traction engine comprising forward and rear frames provided with axles and driving wheels mounted upon said axles, the said frames pivoted together at a point substantially mid-way between said axles, laterally extending arms fixedly attached to said forward and rear frames and means extending between said arms for adjusting said arms with reference to each other and changing the space between their respective extremities, whereby the said forward and rear frames may be adjusted with reference to each other at said pivotal connection for the purpose of steering.

5. In a traction engine, the combination of a live axle, driving wheels mounted upon said live axle, a drum mounted upon said live axle, said drum being independent of said driving wheels, clutch connection between said live axle and said driving wheels, and independent clutch connection between said live axle and said drum.

6. In a traction engine the combination of a live axle, driving wheels mounted upon said axle, ratchet connection between said axle and said driving wheels, and a drum mounted upon said live axle and clutch connection between said live axle and said drum.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

GEORGE R. GOUGHNOUR.

Witnesses:

SYLVIA BORON,
WM. H. MILLER.