No. 821,477. PATENTED MAY 22, 1906.

F. T. FLINCHBAUGH.

ACTUATING GEAR FOR TRACTION ENGINES.

APPLICATION FILED OCT. 12, 1905.

3 SHEETS—SHEET 1.

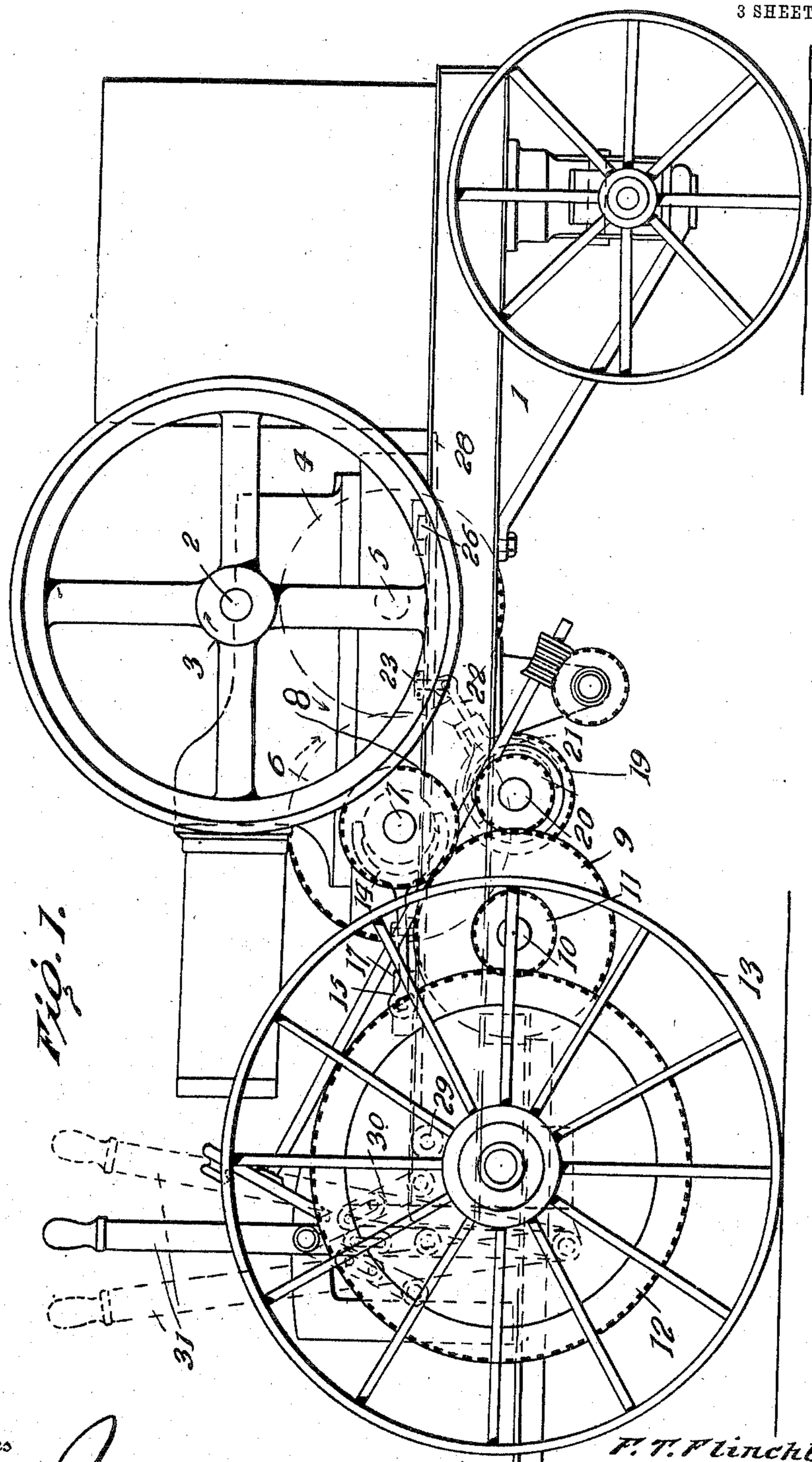

Fig. 1.

Witnesses

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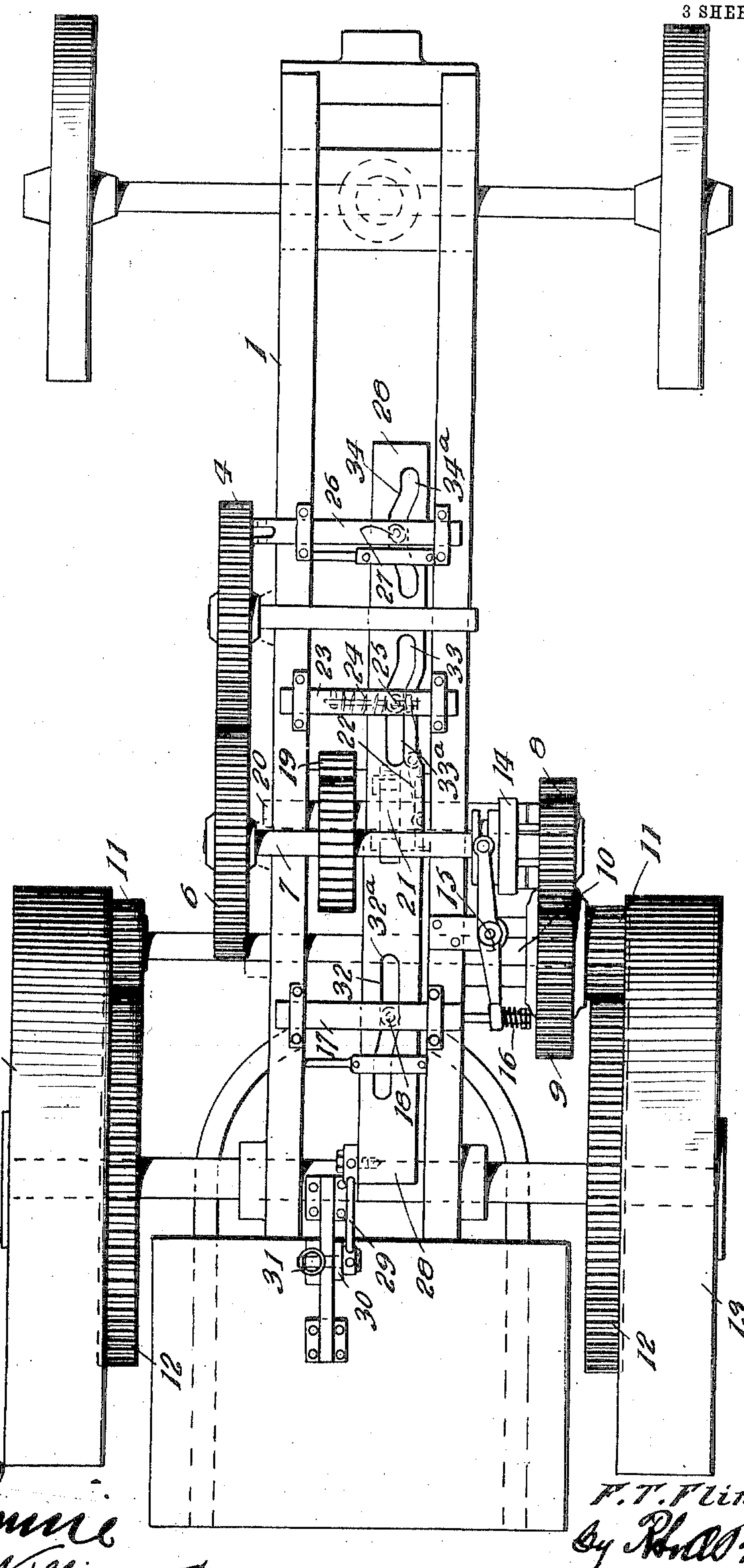
3 SHEETS--SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

Fig. 3.

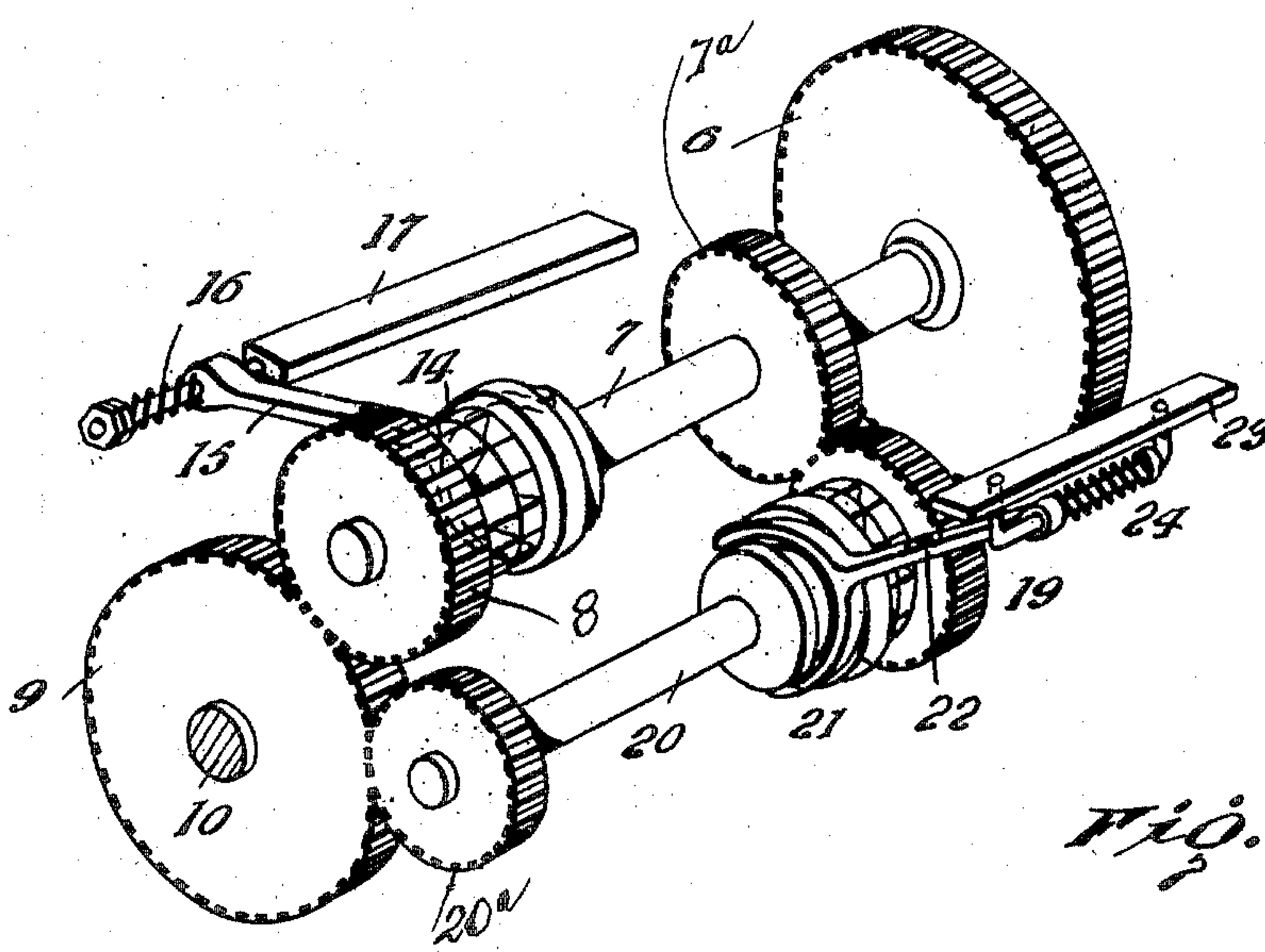


Fig. 4.

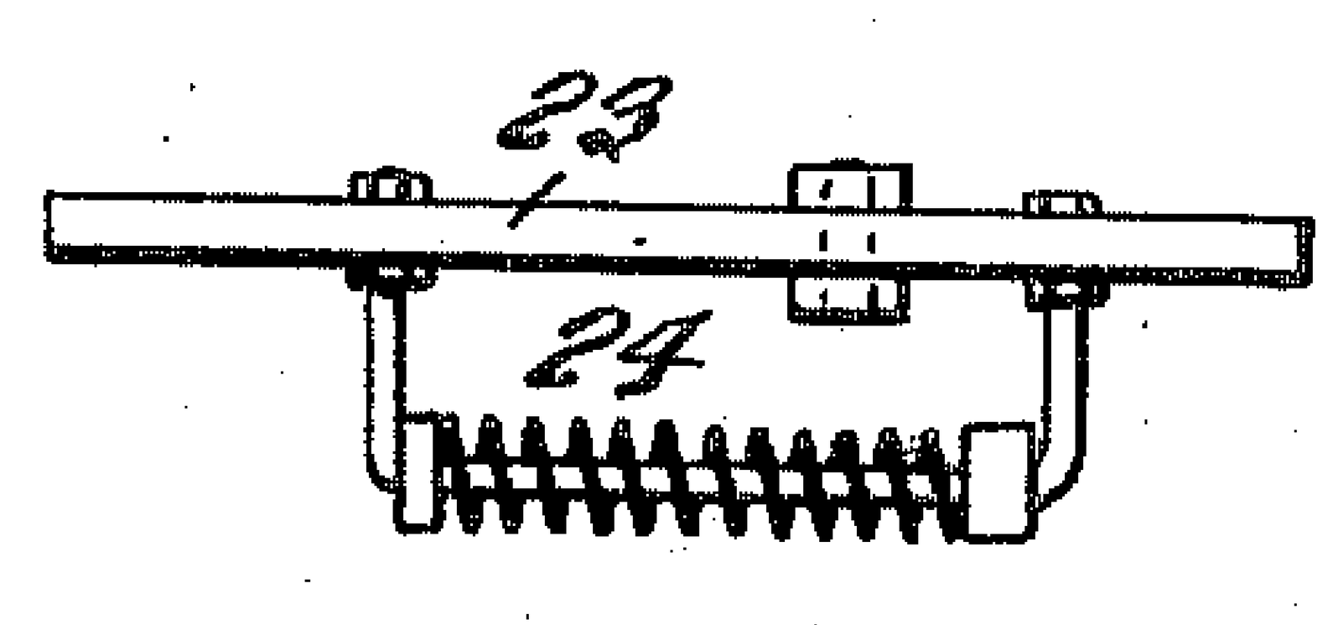
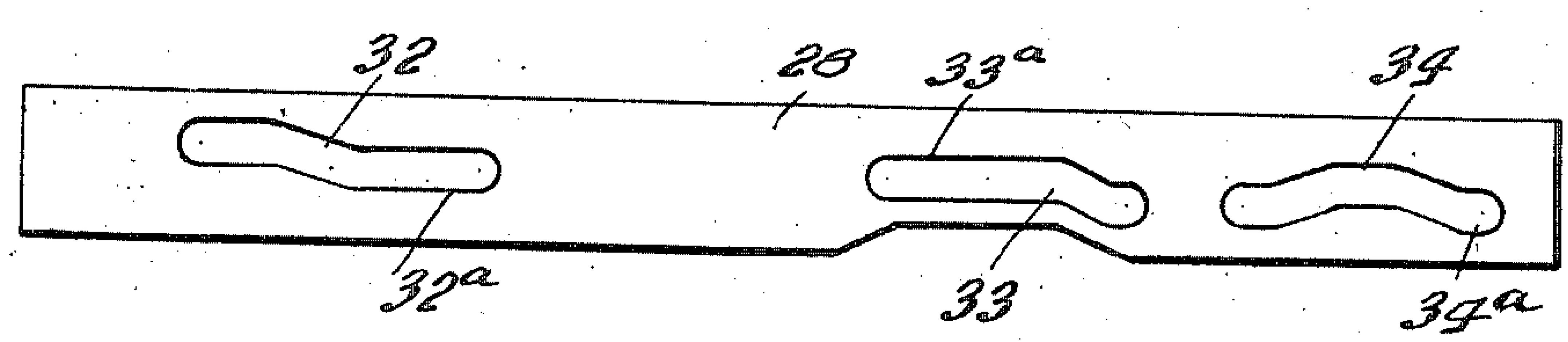


Fig. 5.



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UNITED STATES PATENT OFFICE.

FREDERICK T. FLINCHBAUGH, OF YORK, PENNSYLVANIA.

ACTUATING-GEAR FOR TRACTION-ENGINES.

No. 821,477. Specification of Letters Patent. Patented May 22, 1906.

Application filed October 12, 1905. Serial No. 282 436.

To all whom it may concern:

Be it known that I, FREDERICK T. FLINCHBAUGH, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Actuating-Gear for Traction-Engines, of which the following is a specification.

This invention relates to improvements in actuating-gear for traction-engines, and has for its object the provision of improved means whereby the movement of a manually-operable lever in one direction will first actuate the positive clutches between the gearing and the parts to be driven and then subsequently by the same movement actuate the clutches between the gearing and the prime mover.

In other words, my invention comprises improved means whereby the actuating lever or handle in central position will throw the clutches out of gear, a forward throw of the lever engage the positive clutch with the gearing for driving the traction-engine forward and a continued motion of the lever subsequently engage a friction-clutch on the engine-shaft. The backward motion of the lever from its central or stopped position will in like manner first positively engage the parts to be driven with the backwardly-moving gear and then the friction-clutch on the engine-shaft. At all times with my invention the positive clutches are operated when the friction-clutch on the engine-shaft is disengaged and the power therefore not connected.

The invention consists, essentially, of a sliding shifting bar provided with three cam-slots, operated by a handle or lever, two of said slots being designed for actuation independently of each other, whereby to positively engage the forward or backward moving gears, and the third slot being arranged in either event to connect the engine-shaft to the parts to be driven in either direction.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and accompanying drawings, in which—

Figure 1 is a side elevation of the mechanism embodying the invention. Fig. 2 is a top plan view. Fig. 3 is a perspective view of a portion of the gear mechanism, showing clearly the arrangement of the clutch devices. Fig. 4 is a detail view in elevation of one of the transverse slides and the yielding mounting therefor. Fig. 5 is a detail view of the longitudinal shifting bar.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

Referring to the drawings, the reference-numeral 1 designates a suitable framework for the traction-engine, in which framework are mounted axles for the traveling and driving wheels and on which also are supported the engine or prime mover and the gearing and clutches designed for operation therewith. The main shaft 2 of the engine, which in this instance is preferably a gasolene-engine working always in the same direction, is provided with a pinion 3, gearing with a wheel 4 on a shaft 5, and said wheel 4 in turn meshes with a complementary wheel 6 on a shaft 7. The opposite end of the shaft 7 carries a pinion 8, loose thereon and meshing with a pinion 9 on a shaft 10, and this shaft 10 also carries pinions 11, meshing with spur-gears 12, connected with the traveling wheels 13.

By means of the rotation of the shaft 2 in the direction indicated by the dart in Fig. 1 the train of gearing before described will tend to rotate the wheels 13 in a forward direction when the pinion 8 is coupled to this shaft by any suitable form of clutch. In this instance the clutch for this purpose is designated in the drawings 14 and is of the pin type, as shown, and is designed for actuation by a lever 15, fulcrumed intermediate its ends on a bracket secured to one of the sides of the frame 1 and having a yielding connection by means of a spring 16 with one end of a bar 17, mounted to slide transversely across the framework and provided with an anti-friction-roller 18. To reverse the movement of the shaft 10 for the purpose of causing the traction-engine to travel backwardly, there is provided a pinion 19, which is loose upon a shaft 20 and is designed to be coupled thereto by means of a pin-clutch 21. The shaft 20 carries at one end a pinion 20^a, meshing directly with the pinion 9 on the shaft 10. The pinion 19 meshes directly with the pinion 7^a, fast on the shaft 7. The clutch 21 is, like the clutch 14, actuated by a lever, (designated 22,) and the rear end of said lever is connected to a transversely-extending slide-bar 23, provided with a yielding connection or mounting 24. By reference particularly to Fig. 3

it will be seen that when the pinion 19 is coupled to the shaft 20, the pinion 8 being loose on the shaft 7 at the time, the shaft 20 will be driven from the shaft 7 and will turn the pinion 20ª and pinion 9 in a direction to cause the traveling wheels 13 to move rearwardly. The slide 23 is provided with a roller 25. For the purpose of connecting the countershafts or driving-shafts with the engine proper or prime mover I have provided a slide-bar 26, which is also mounted transversely of the framework 1 and is designed to actuate the friction-clutch. The slide 26 is also provided with an antifriction-roller 27.

As best seen in Fig. 2, a longitudinally-extending shifting bar 28 is mounted to slide longitudinally in the framework 1, and its rear end is connected by link 29 and lever 30 to a manually-operable lever or handle 31. The shifting bar 28 is provided with three slots, one for each of the slides 17, 23, and 26, and said slots are designated, respectively, 32, 33, and 34. The roller 18 of the slide 17 fits in and is guided by the cam-slot 32, and the other rollers 25 and 27 of the other slides are similarly mounted in the other two cam-slots, respectively. The cam-slots 32 and 33 work in opposite directions and are provided opposite their working portions with straight extensions 32ª and 33ª, so that when the shifting bar 28 is moved in a direction for the roller to enter the straight portion of the slot the latter will have no effect upon the respective slides 17 and 23. The straight portions of the two slots extend in opposite directions—that is, toward each other—so that when the shifting bar is moved in one direction one of said slots will be actuated without the other, and vice versa. The cam-slot 34, however, is a double cam having two actuating portions 34ª on each side of a middle straight portion, so that no matter in what direction the shifting bar 28 is moved said slot 34 will operate to shift the slide 4.

In the operation of the device it is to be assumed that Fig. 2 illustrates the parts with two of the clutches disengaged and the engine in uncoupled relation to its driven shafts. If then the handle 31 be moved forwardly or to the right, as viewed in Fig. 1, it will simply move the shifting bar 28, and at once, as will be evident by an inspection of Fig. 2, the slide 17 will be actuated to rock the lever 15, and thereby move the clutch 14 into engagement with the pinion 8. Hence the gearing will be coupled to drive the traction-engine forwardly. The continued movement of the handle 31 in the forward direction will (the coupling connection before described just having been completed) effect a sliding of the bar 26 through the instrumentality of the cam 34, and thereby actuate the clutch on the engine-shaft. In this manner the positive clutches between the gearing and the part to be driven are first coupled by the movement of the handle-bar 31, and the continued movement of the same handle in the same direction will then effect the uncoupling connection between the gearing and the prime mover. A reverse movement of the handle 31 will first disengage the clutch on the engine-shaft and then disconnect the positive clutches to bring the parts to rest. On the other hand, the backward movement of the handle 31 from its central position will actuate the slide 23 through the instrumentality of the cam-slot 33, although this movement will not effect the slide 17, and such movement of the slide 23 will cause, as has been before described, the traction-engine to be operatively geared to travel backwardly, while the further movement of the handle in the same direction will effect the coupling of the gear to the driving-shafts of the engine or prime mover, as will be readily understood. The yielding mounting of the two slides 17 and 23 with respect to their levers 15 and 22 is advantageous in the event of pins on the clutches being in such position that they cannot be engaged with each other until the engagement of the friction-clutch on the engine-shafts shall have transmitted sufficient power to turn the idle shaft 7 and until the position of the pins is changed.

From the foregoing description, in connection with the accompanying drawings, it will be seen that the longitudinally-movable shifting bar 28 may effectively move either the forwardly-actuating or backwardly-actuating clutch, one independently of the other. Simultaneously by the actuation of either of said clutches will couple the driving parts of the engine or prime mover. By this means no interference between the clutches can ever occur, and there is always insured that the positive clutches will be engaged while the traction-engine is at rest, thereby avoiding any undue strain or injury to the gearing.

Having thus described the invention, what is claimed as new is—

1. The herein-described actuating-gear for traction-engines comprising, in combination with a wheel-supported framework and the prime mover mounted thereon gearing designed to turn the traveling wheels in one direction or the other, independent clutches for the respective gearing for the forward and backward movements, an operative connection betwen said gearing and the prime mover, two slide-bars mounted transversely of the framework and operatively connected to the respective clutches of the gearing, a third slide-bar mounted transversely of the framework and designed to couple the prime mover to the gearing and a longitudinally-extending shifting bar mounted to move longitudinally in the framework across the three slide-bars and provided with three cam-slots one for each of the slide-bars, the cam for the slide that is designed to couple and uncouple

the prime mover being provided with an intermediate straight portion and two end inclined portions and the other two cams being provided with straight portions facing each other and with oppositely-extending inclined portions, as and for the purpose set forth.

2. Actuating-gear for traction-engines, comprising, in combination with the wheel-supported framework and prime mover mounted thereon, of two sets of gearing driven from said prime mover one set being designed to move the traction-engine forwardly and the other rearwardly, clutches designed to couple the gearing for forward movement and backward movement respectively said clutches including spring-pressed levers mounted on the framework, transverse slide-bars mounted across the framework and connected respectively to said levers, a third slide-bar mounted to move transversely on the framework and designed to couple and uncouple the prime mover to the said two sets of gearing, and a longitudinally-movable shifting bar mounted between the side bars of the frame and means for shifting the same, said shifting bar being provided with three independent or separate cam-slots one in advance of the other, one of said slots being operatively connected to the slide-bar for uncoupling the prime mover from the gearing and consisting of an intermediate straight portion and two inclined end portions and the other cam-slots being operatively connected to the other slide-bars respectively and provided with two straight portions facing each other and with two inclined portions extending in opposite directions from each other.

3. In a traction-engine, the combination with the wheel-supported framework and the prime mover thereon, of a shaft 7 designed to be turned by the prime mover always in the same direction two pinions carried by said shaft one being fast thereon and the other loose, a shaft 20 mounted in the framework and provided with a fast pinion and a loose pinion, the latter meshing directly with the fast pinion of the shaft 7, a shaft 10 designed to drive the traveling-wheels and provided with a pinion meshing with the loose pinion of the shaft 7 and the fast pinion on the shaft 20, independently-acting clutches designed to couple the loose pinions with their respective shafts, transversely-extending slide-bars mounted in the framework and operatively connected to the clutches, a third slide-bar mounted transversely of the framework and designed to couple and uncouple the prime mover to and from the shaft 7 and a longitudinally-movable shifting bar in the framework and provided with three separate cams designed to actuate respectively the three slide-bars, the cam for the slide-bar designed to couple and uncouple the prime mover being formed with an intermediate straight portion and two inclined portions and the other cams being formed with straight portions facing each other and oppositely-extending inclined portions, as and for the purpose set forth.

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

FREDERICK T. FLINCHBAUGH. [L. S.]

Witnesses:

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JOHN F. RUDISILL.