No. 620,735. Patented Mar. 7, 1899.

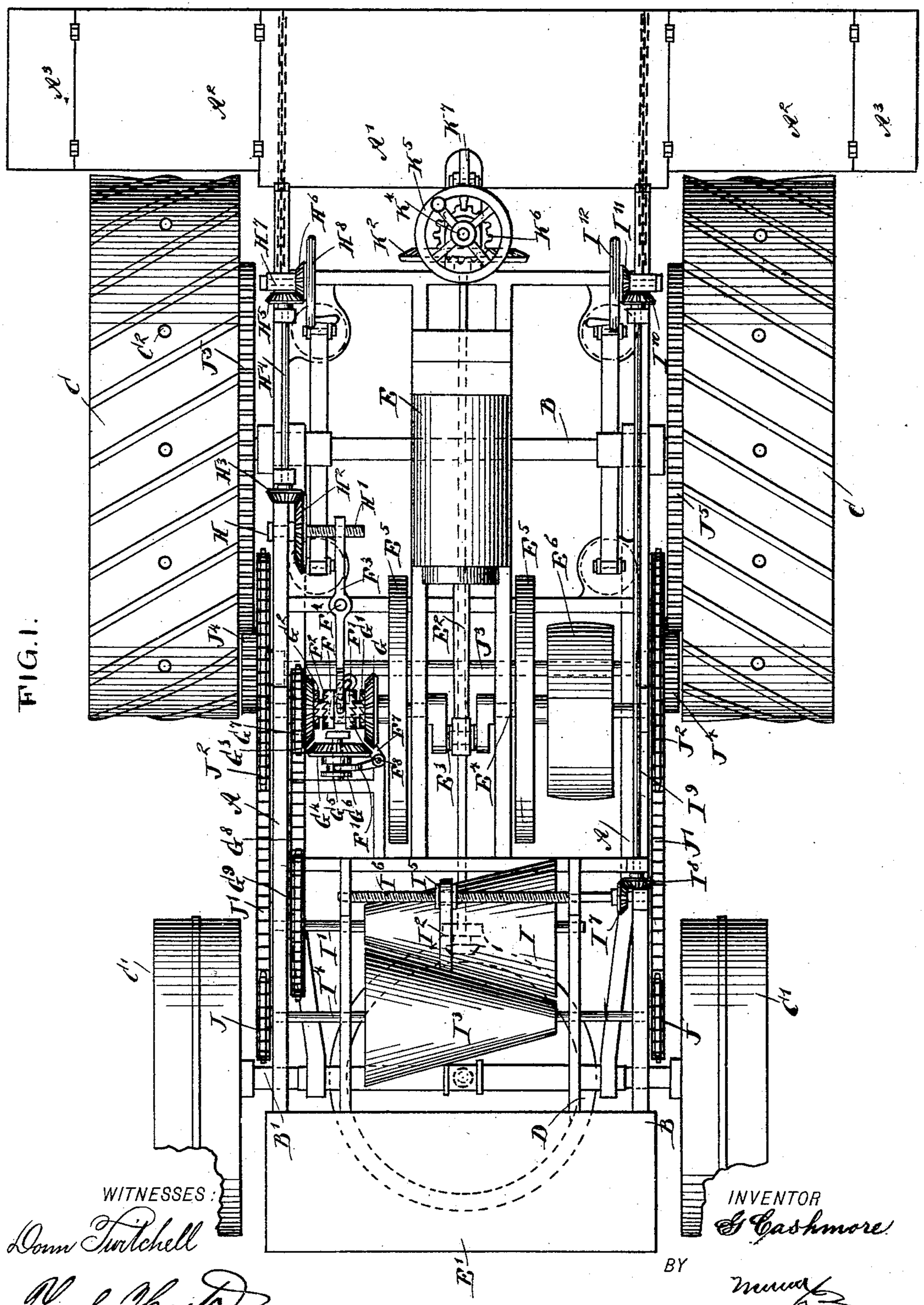
G. CASHMORE.

TRACTION ENGINE.

(Application filed Dec. 29, 1897.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.



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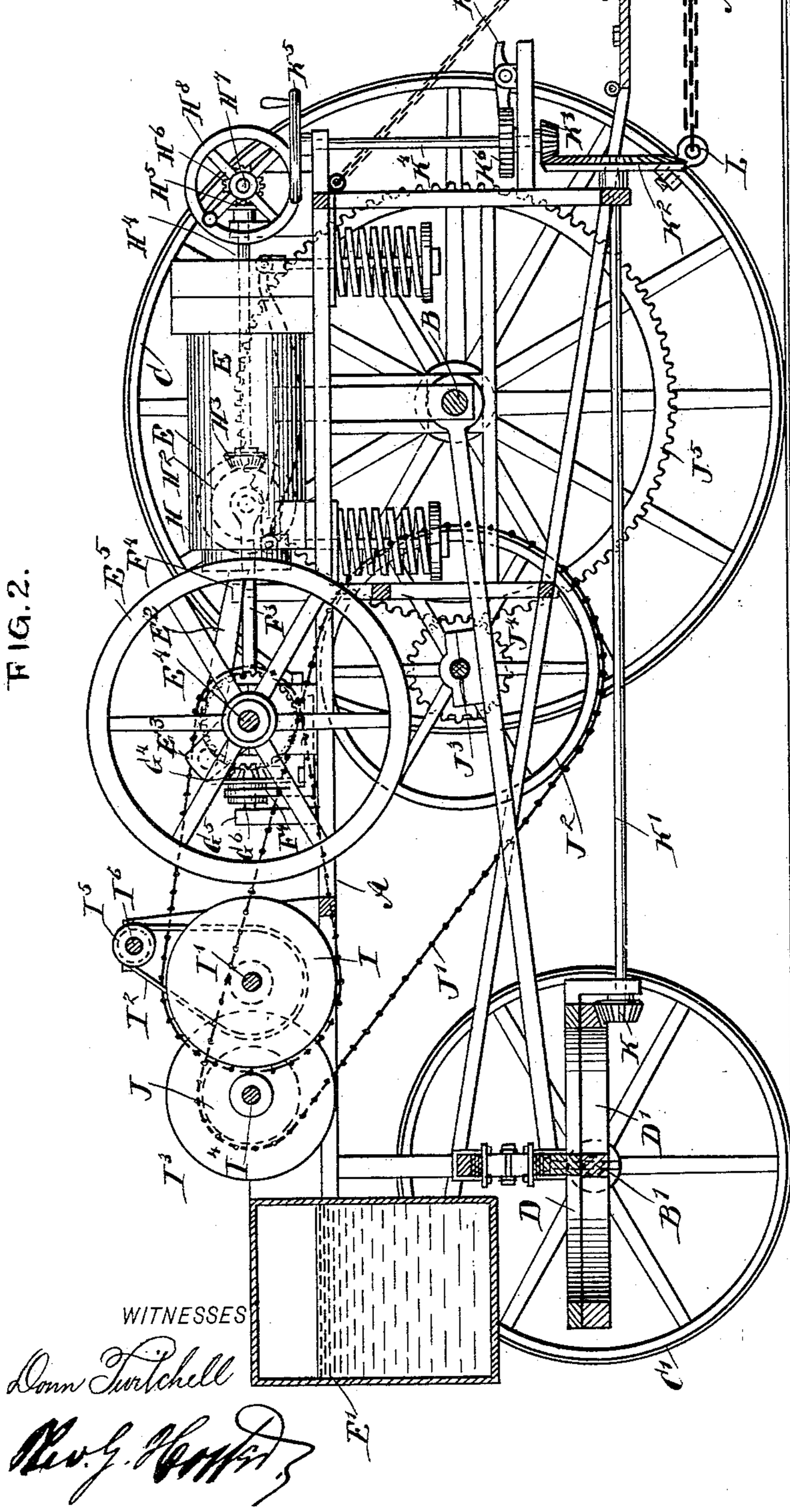

FIG. 2.

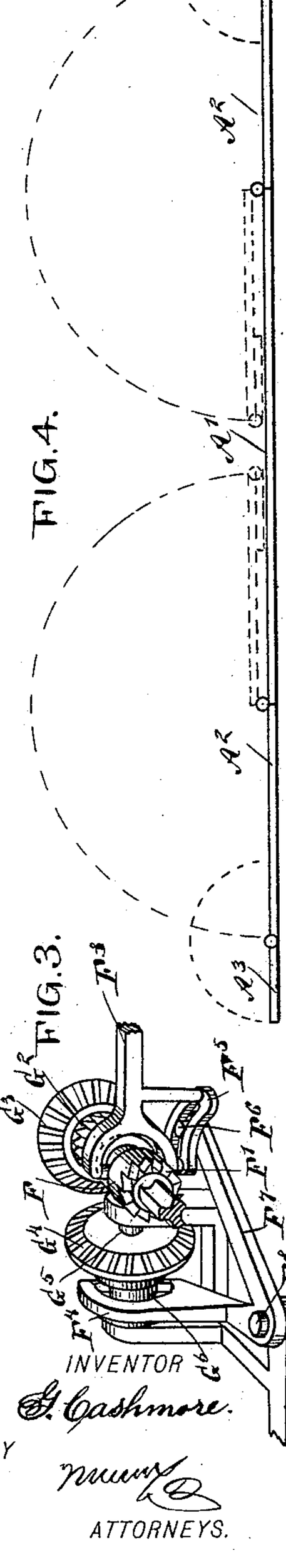

FIG. 4.

FIG. 3.

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GEORGE CASHMORE, OF OAKLAND, CALIFORNIA.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 620,735, dated March 7, 1899.

Application filed December 29, 1897. Serial No. 664,275. (No model.)

To all whom it may concern:

Be it known that I, GEORGE CASHMORE, of Oakland, in the county of Alameda and State of California, have invented a new and Improved Traction-Engine, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved traction-engine arranged to be driven by an explosion-motor, such as a gasolene or oil engine, the machine being comparatively simple, durable, and light in construction to permit of readily driving the machine from one place to another, the construction permitting of readily changing it to a portable or stationary engine.

The invention consists of novel features and parts and combinations of the same, as will be fully described hereinafter, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement. Fig. 2 is a sectional side elevation of the same. Fig. 3 is an enlarged perspective view of the clutch mechanism for the reversing device, and Fig. 4 is an end elevation of the folded platform.

The improved traction-engine is provided with a suitably-constructed frame A, yieldingly mounted at one end by interposed springs on the axle B of the traction-wheels C, the other end of the frame being also set on springs and provided with a fifth-wheel D, resting on the upper surface of a turnable gear-wheel D′, carrying the axle B′ for the steering-wheel C′.

On the frame A, and preferably directly over the axle B, is mounted the cylinder of an explosion-motor E of any approved construction and deriving its motive agent from a tank E′, carried at the end of the frame A over the fifth-wheel D, as is plainly shown in the drawings. The motor E is provided with the usual piston, connected by a pitman E^2 with a crank-arm E^3, secured on a drive-shaft E^4, journaled in suitable bearings on the frame A and carrying fly-wheels E^5 and a pulley E^6, connected by belt with other machinery for actuating the same when the device is used as a stationary or portable engine.

In order to impart a forward or backward rotary motion to the traction-wheels C to move the machine from one place to another, I provide the following device: On one end of the shaft E^4 is mounted to turn and to slide a double clutch F, provided with clutch-teeth $F' F^2$, of which the clutch-teeth F′ are adapted to engage similar teeth G′ on a bevel gear-wheel G, mounted to rotate loosely on the shaft E^4. The other clutch-teeth F^2 are adapted to engage similar teeth G^2 on a bevel gear-wheel G^3, likewise mounted to rotate on the shaft E^4, the bevel gear-wheels G G^3 being adapted to be connected with each other by an intermediate gear-wheel G^4 at the time the clutch-teeth F′ are in engagement with the clutch-teeth G′. Normally the clutch F stands out of mesh with either of the clutch-teeth G′ or G^2; but it can be moved in mesh with either by a shifting-lever F^3, engaging a clutch F and fulcrumed at F^4 on the main frame A.

The movement of the wheel G^4 in and out of mesh with the gear-wheels G G^3 is controlled from this shifting-lever F^3, the said gear-wheel G^4 being mounted to turn and to slide on a stud G^5, carried by the frame A, the hub G^6 of the gear-wheel being engaged by a shifting-fork F^4, actuated from the shifting-lever F^3 by providing the latter with a segmentally-slotted arm F^5, engaging a pin F^6 on an arm F^7, extending from the frame-shaft F^8 of the shifting-lever F^4 for the bevel gear-wheel G^4.

Now it is evident that when the lever F^3 is caused to swing outwardly the clutch-teeth F^2 move in mesh with the clutch-teeth G^2, so that the rotary motion of the shaft E^4 is transmitted to the gear-wheel G^3, while the gear-wheels G G^4 remain stationary. When, however, the lever F^3 is moved to shift the clutch F inwardly, then the clutch-teeth F′ move in mesh with the clutch-teeth G′ of the bevel gear-wheel G to rotate the latter from the drive-shaft, and at the same time the segmentally-slotted arm F^5 imparts a swinging motion to the arm F^7 and to the shifting-fork F^4 to slide the gear-wheel G^4 in mesh with the gear-wheels G G^3. Thus the rotary motion of the bevel gear-wheel G is imparted to the intermediate bevel gear-wheel G^4, which in turn rotates the bevel gear-wheel G^3, but in an opposite direction to that which it received

when directly geared to the shaft E^4, as above mentioned.

When the shifting-lever F^3 moves into the normal position shown in Fig. 1, then a swinging motion is given to the shifting-fork F^4 by the means above described to move the bevel gear-wheel G^4 with the gear-wheels G and G^3.

In order to impart a swinging motion to the shifting-lever F^3 for the purpose above described, I provide the outer end of the said lever with a nut engaged by a threaded end H′ of a shaft H, mounted to turn in suitable bearings on the frame A. A bevel gear-wheel H^2 is secured on the shaft H and is in mesh with a bevel-pinion H^3, secured on a longitudinally-extending shaft H^4, journaled in suitable bearings on the frame A and carrying at its outer end a bevel-pinion H^5 in mesh with a bevel-pinion H^6, secured on a shaft H^7, provided with a hand-wheel H^8 under the control of the operator standing on a platform A′, carried by the frame A.

Now by the arrangement described the operator can turn the hand-wheel H^8 in either direction to impart a rotary motion to the shaft H^4 by the gear-wheels H^6 H^5, and the movement of the shaft H^4 is transmitted by the pinion H^3 and gear-wheel H^2 to the shaft H, which by the threaded end H′ imparts a swinging motion to the shifting-lever F^3, according to the direction in which the hand-wheel H^8 is turned.

The bevel gear-wheel G^2 carries a sprocket-wheel G^7, over which passes a sprocket-chain G^8, also passing over a sprocket-wheel G^9, secured on a cone-shaft I′, journaled in suitable bearings in the main frame A and carrying a cone I, connected by a belt I^2 with a second cone I^3, attached to a shaft I^4, parallel to the shaft I′, and likewise journaled in suitable bearings on the frame A. The cones I I^3 extend in opposite directions relatively to each other, and the belt I^2 connects the cones with each other to rotate the cone I^3 and its shaft I^4 from the cone I, the speed transmitted depending on the position of the belt I^2 between the cones. Thus when the belt I^2 is at the apex of the cone I a slow rotary motion is given to the cone I^3, and when the said belt is moved toward the base end of the cone I a fixed rotary motion is given to the cone I^3. The belt I^2 passes over a nut-pulley I^5, screwing on the threaded end of a shaft I^6, mounted to turn in suitable bearings in the frame A above the cone I.

On the shaft I^6 is secured a bevel gear-wheel I^7 in mesh with a bevel gear-wheel I^8, secured on one end of a longitudinally-extending shaft I^9, mounted to rotate in bearings affixed to the main frame A. The other end of the shaft I^9 carries a bevel gear-wheel I^{10} in mesh with a bevel gear-wheel I^{11}, carrying a hand-wheel I^{12}, adapted to be turned by the operator standing on the platform A′ to impart a rotary motion to the said shaft I^9 by the bevel gear-wheels I^{11} I^{10}, the rotary motion of the shaft I^9 being transmitted by the bevel gear-wheels I^8 I^7 to the screw-rod shaft I^6 to shift the nut-pulley I^5 and move the plate I^2 into the desired position for transmitting a fast or slow rotary motion to the cone I^3.

On the ends of the shaft I^4, carrying the cone I^3, are secured sprocket-wheels J, connected by a sprocket-chain J′ with a sprocket-wheel J^2, secured on a shaft J^3, extending transversely and mounted to turn in suitable bearings on the frame A. On the ends of the shaft J^3 are secured pinions J^4 in mesh with gear-wheels J^5, attached to the inner faces of the traction-wheels C, so that when the shaft I^4 is rotated, as above described, its rotary motion is transmitted by the sprocket-wheels J J^2 to the sprocket-wheel J′, the shaft J^3, the pinions J^4, and the gear-wheels J^5 to the traction-wheels C, so that the machine is moved forward or backward, according to the direction in which the shaft I^4 is turned from the main driving-shaft E^4 by the mechanism above explained.

The gear-wheel D′ of the fifth-wheel D is in mesh with a pinion K, secured on a shaft K′, extending longitudinally and journaled in suitable bearings carried by the main frame A. The end of the shaft K′, near the platform A′, is provided with a large bevel gear-wheel K^2 in mesh with a pinion K^3, secured on the lower end of a vertically-disposed shaft K^4, likewise journaled in suitable bearings in the main frame A. The upper end of this shaft K^4 carries a hand-wheel K^5, adapted to be turned by the operator standing on the platform A′ to impart a rotary motion to the shaft K^4 and by the gear-wheels K^3 K^2 to the shaft K′, which by its pinion K turns the wheel D′ to steer the steering-wheel C′ to the right or the left, according to the direction in which the machine is intended to travel.

Normally the shaft K^4 is locked in position when the axles B′ B are parallel, and for this purpose I provide the said shaft with a toothed wheel K^6, engaged by a pawl K^7 under the control of the foot of the operator standing on the platform A′. The pawl K^7 has to be thrown out of mesh with the wheel K^6 before the wheel K^4 can be turned, for the purpose above described.

In order to draw the machine out of a bog or soft place, I provide the following device: In the rims of the traction-wheels C are formed apertures C^2 for attaching a bolt L to the rim of a wheel, the said bolt being connected with one end of a chain N, adapted to be extended ahead of the machine beyond the bog, to be then attached to a tree or other support. Now when the motor is started and a rotary motion is given to the traction-wheels then the chain or chains N wind up on the said wheels and the machine is correspondingly drawn forward out of the swampy place to a place of safety.

The platform A′ is preferably hinged to the main frame A and is supported in a horizontal position by suitable chains O, extending upwardly and inwardly to the frame to be at-

tached to the upper end thereof, as shown in Fig. 2. The platform A′ is provided at its ends with hinged extension-platforms A^2, reaching beyond the outer faces of the traction-wheels, and on the outer ends of the extension-platforms A^2 are hinged additional platforms A^3 to permit the operator to completely observe all parts of the machine without leaving the platform A′ and the extensions. By having the platforms arranged as described they can be readily folded up when not in use, as indicated in dotted lines in Fig. 4.

By the use of the cone transmitting-gear the machine can be started very slowly and without shock or jar, and when the engine is moving forward the speed can be increased gradually or diminished, according to the grade of the road over which the machine travels. By moving the clutch F into a normal position, as shown in Fig. 2, the transmission for the traction-wheels is cut out and the motor can be used for driving machinery from the pulley E^6.

The gear-wheels J^4 J^5 and the shaft J^3 can be dispensed with by securing the wheel J^2 directly to the axle B or the traction-wheels C.

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

1. A reversing device comprising a driven shaft, clutch gear-wheels mounted to rotate loosely on the said shaft, a double clutch mounted to turn with and to slide on the said shaft to engage either of the said clutch gear-wheels, intermediate gear-wheels adapted to move simultaneously in or out of mesh with the said clutch gear-wheels, a shifting-lever for the said clutch and connected with the said intermediate gear-wheel to shift the latter on moving the clutch, the connection consisting of a second shifting-lever for the intermediate gear-wheel, an arm extending from this second shifting-lever, and a slotted segment carried by the first shifting-lever and engaging the said arm, substantially as shown and described.

2. A reversing device, comprising a driven shaft, two loosely-mounted gears thereon each carrying one half of the clutch, a collar having the complementary halves of the clutches thereon and mounted to slide upon the shaft between the gears, a lever engaging said collar to shift it, said lever having a threaded hole, a threaded shaft fitting said hole and having a thrust-bearing or fixed end support, and means for rotating said threaded shaft, substantially as described.

GEORGE CASHMORE.

Witnesses:
J. B. RANDOLPH,
W. A. THOMPSON.