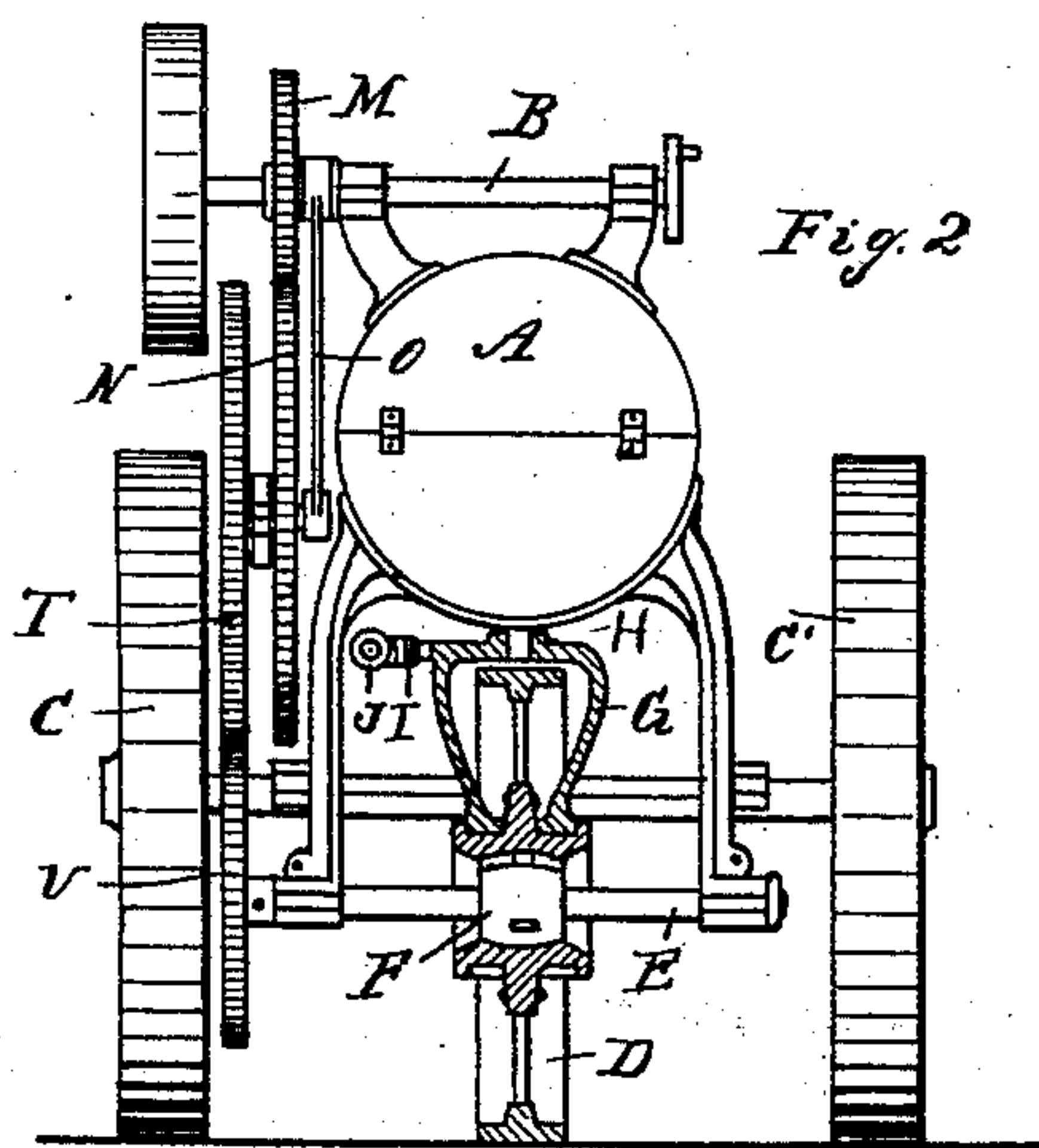
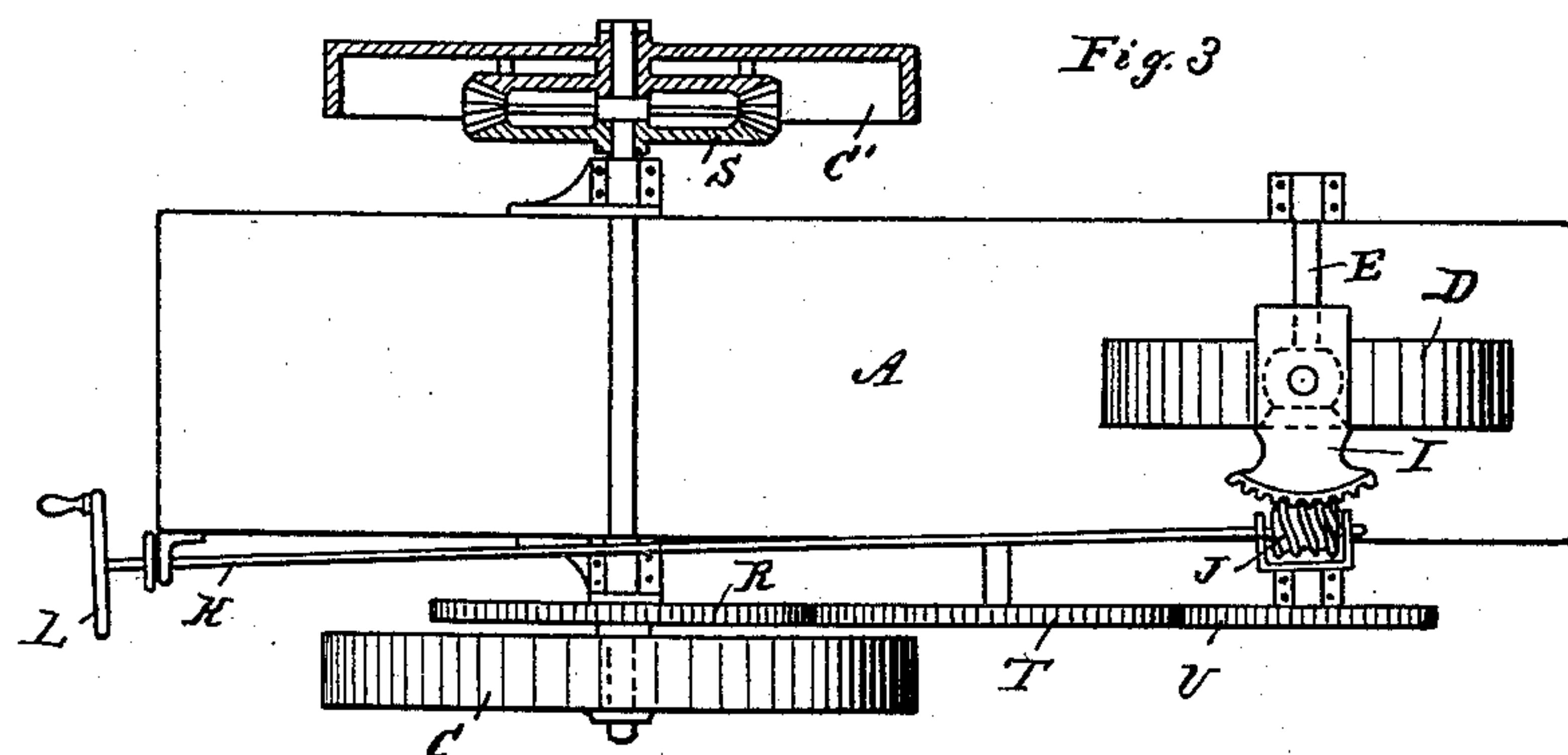
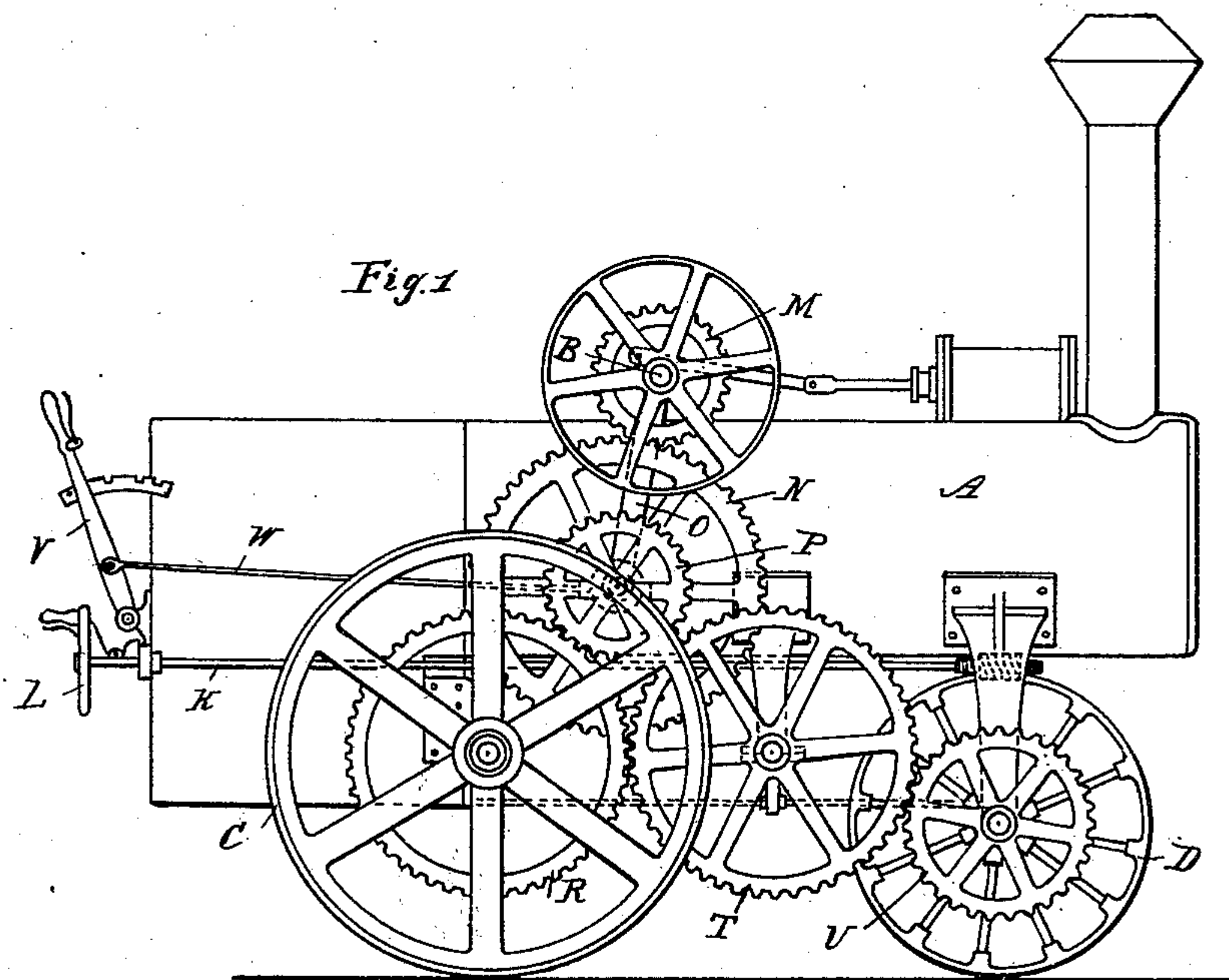


(No Model.)

S. E. JARVIS.
TRACTION ENGINE.

No. 372,022.

Patented Oct. 25, 1887.



Attest:
John Schuman.
N. J. Sprague

Inventor:
Samuel E. Jarvis.
by his Atty
Thos. S. Sprague

UNITED STATES PATENT OFFICE.

SAMUEL E. JARVIS, OF LANSING, MICHIGAN.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 372,022, dated October 25, 1887.

Application filed March 10, 1887. Serial No. 230,338. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL E. JARVIS, of Lansing, in the county of Ingham and State of Michigan, have invented new and useful Improvements in Traction - Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

10 This invention relates to new and useful improvements in traction-engines; and it consists in the novel construction and arrangement of the traction and steering gear, by means of which I have succeeded in constructing a traction-engine supported on three wheels—one front and two hind wheels—all three of which are traction-wheels, the front wheel being at the same time the steering-wheel, all as hereinafter described.

20 In the drawings which accompany this specification, Figure 1 is a side elevation of my improved traction-engine. Fig. 2 is a front elevation thereof with the front traction in section. Fig. 3 is a plan.

25 A is the boiler; B, the crank-shaft of the engine; C C', the hind wheels, and D the front wheel.

30 The front axle, E, is journaled in stationary bearings formed by suitable brackets secured to the under side of the boiler, and the single front wheel, D, is placed under the center of the boiler and connects with the front axle through a ball-and-socket gear, F, by means of which the front wheel has to revolve with its axle, while at the same time it is free to turn in any direction.

40 The steering is effected by means of a stirrup, G, which loosely embraces the hub of the wheel and turns on a central pivot, H, which is preferably formed by a king-bolt secured to the under side of the boiler engaging into a hole in the top of the stirrup. From one side of this stirrup projects a spirally-toothed sector, I, which engages with a worm-screw, J, secured to the forward end of the shaft K and provided with a suitable hand-wheel, L, all so arranged that the turning of the hand-wheel L effects the steering of the front wheel. The tractive power is conveyed from the crank-shaft to both the front and rear axles by a gear-wheel, M, secured upon the crank-shaft

and meshing with a gear-wheel, N, journaled on a stub shaft which is carried by a swinging arm, O, pivoted on the crank-shaft. A gear-wheel, P, journaled upon the same stub shaft 55 and connected with the hub of the gear-wheel N, transmits the motion of the gear-wheel R, which is secured upon the hind axle. One of the hind wheels is fast upon the hind axle and the other is connected therewith through 60 the medium of a compensating gear, S. The gear-wheel R transmits motion to the front axle through the medium of the intermediate gear-wheel, T, and the gear-wheel U, which latter is fast on the front axle. 65

The intermediate gear, T, may be supported by hangers from the under side of the boiler, as shown, or in any other suitable manner, and instead of one intermediate gear-wheel there may be three, if the intervening space 70 between the front and rear axles should make such an arrangement more desirable or necessary.

75 The arrangement of the swinging arm O and the gear-wheels P, R, and T is such that by swinging the arm O forward or backward the gear-wheel P may be thrown in or out of gear with either or both of the other gear-wheels, whereby the traction-engine can be run forward or backward or stopped, as desired. This is accomplished by means of a suitable hand-lever, V, and a connecting-rod, W, between said lever and the swinging arm O. 80

85 It will be seen that my construction involves a very simple traction-gear, which greatly reduces the dead-weight, while at the same time the traction and steering is accomplished on the most desirable plan, all the wheels being drivers, and the single steering-wheel under the front end permitting of turning very sharp corners and facilitating the climbing of steep grades. 90

I arrange my steering gear beneath the boiler, where it is much easier to operate than when placed above the same. 95

What I claim as my invention is—

1. In a traction-engine, the combination of a stationarily-journaled drive-axle, a ball-and-socket gear on said axle, a traction-wheel the hub of which forms the socket part of said gear, and a steering-stirrup loosely engaging the hub of the traction-wheel and having a 100

stationary pivot pendent from the under side of the boiler, all substantially as described.

2. In a traction-engine, the combination of a stationarily-journaled front drive-axle, a ball-and-socket gear on said axle, a traction-wheel the hub of which forms the socket part of said gear, a steering-stirrup loosely engaging the hub of the traction-wheel, and a pivotal king-bolt connection between said steering-stirrup and the forward lower end of the boiler, all substantially as described.

3. In a traction engine, the combination of a stationarily-journaled front drive-axle, a central ball and-socket gear on said axle, a traction-wheel the hub of which forms the socket part of said gear, a steering stirrup loosely engaging the hub of the traction-wheel, a pivot between the top of said stirrup and the under side of the boiler, a spirally-toothed sector carried by said stirrup, a worm-screw engaging with said sector, and suitable actuating connection for turning said worm-screw, all arranged to operate substantially as described.

4. In a traction engine, the combination of a stationarily-journaled front axle, a central ball-and-socket gear on said axle, a traction-wheel the hub of which forms the socket part of said gear, a stirrup loosely engaging the hub of the traction-wheel and having a stationary pivot-connection with the lower side of the boiler, drive connection between the crank-shaft and the front axle, said drive-connection including a gear-wheel carried by a swinging arm supported by said crank-shaft, and steering-gear

for the stirrup of the traction-wheel on its pivot, substantially as described.

5. In a traction-engine, the combination of the front axle, E, journaled in stationary bearings secured to the under side of the boiler, the ball-and-socket gear F on the front axle, the front drive-wheel, D, the hub of which forms the socket of the ball-and-socket gear, the stirrup G, embracing the hub of the drive-wheel D, the pivot-connection H between the top of the stirrup and the under side of the boiler, the spirally-toothed sector I, the worm-screw J and its actuating-connection, and drive-connection between the front axle and the crank-shaft, all substantially as described.

6. In a traction-engine having front and rear traction, the combination of the gear-wheel M on the crank-shaft, the swinging arm O, carrying the connected gear-wheels P N, the gear-wheels R U, secured on the front and rear axles, respectively, and the intermediate gear-wheel, T, all substantially as described.

7. In a traction-engine, the combination of the gear-wheel M on the crank-shaft, the swinging arm O, pivoted on the crank-shaft and carrying a stub-axle, the connected gear-wheels P N, journaled on said stub-axle, the gear-wheels R U, secured on the front and rear axles, respectively, the intermediate gear-wheel, T, and the reversing-lever V, and connecting-rod W, all substantially as described.

SAMUEL E. JARVIS.

Witnesses:

H. S. SPRAGUE,

T. E. ROBERTSON.