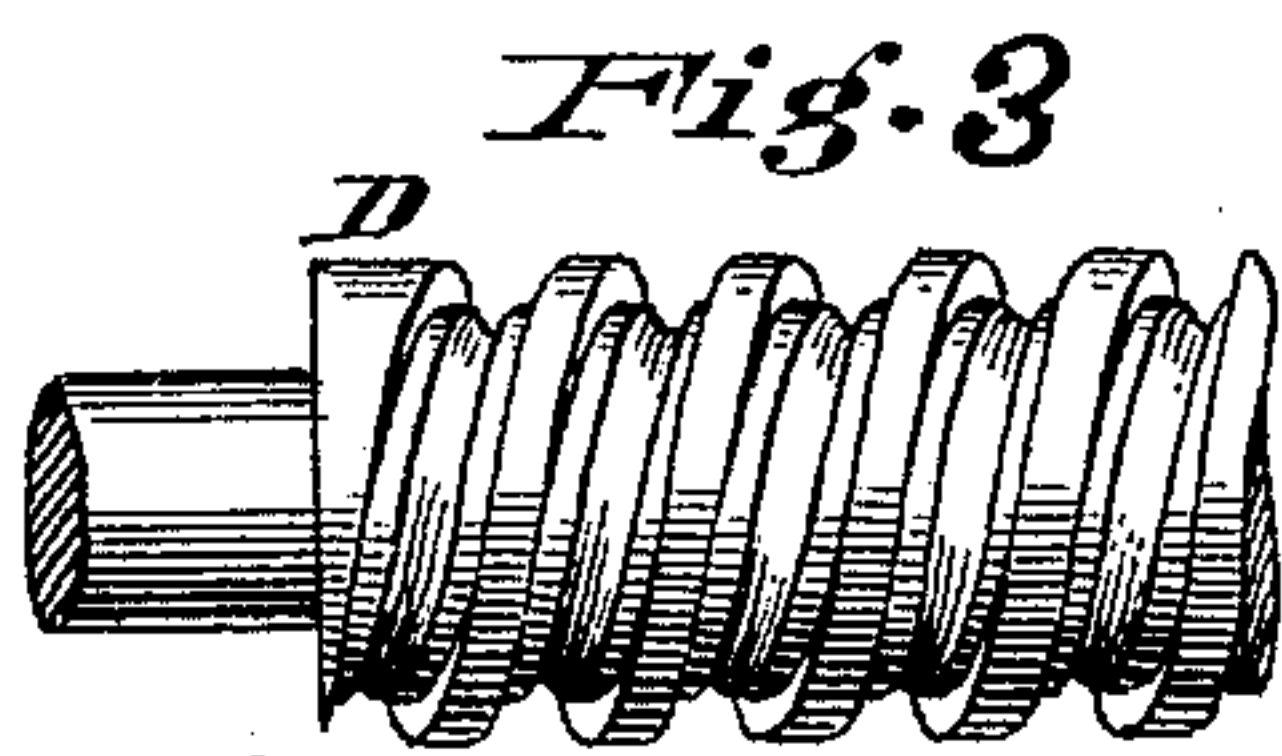
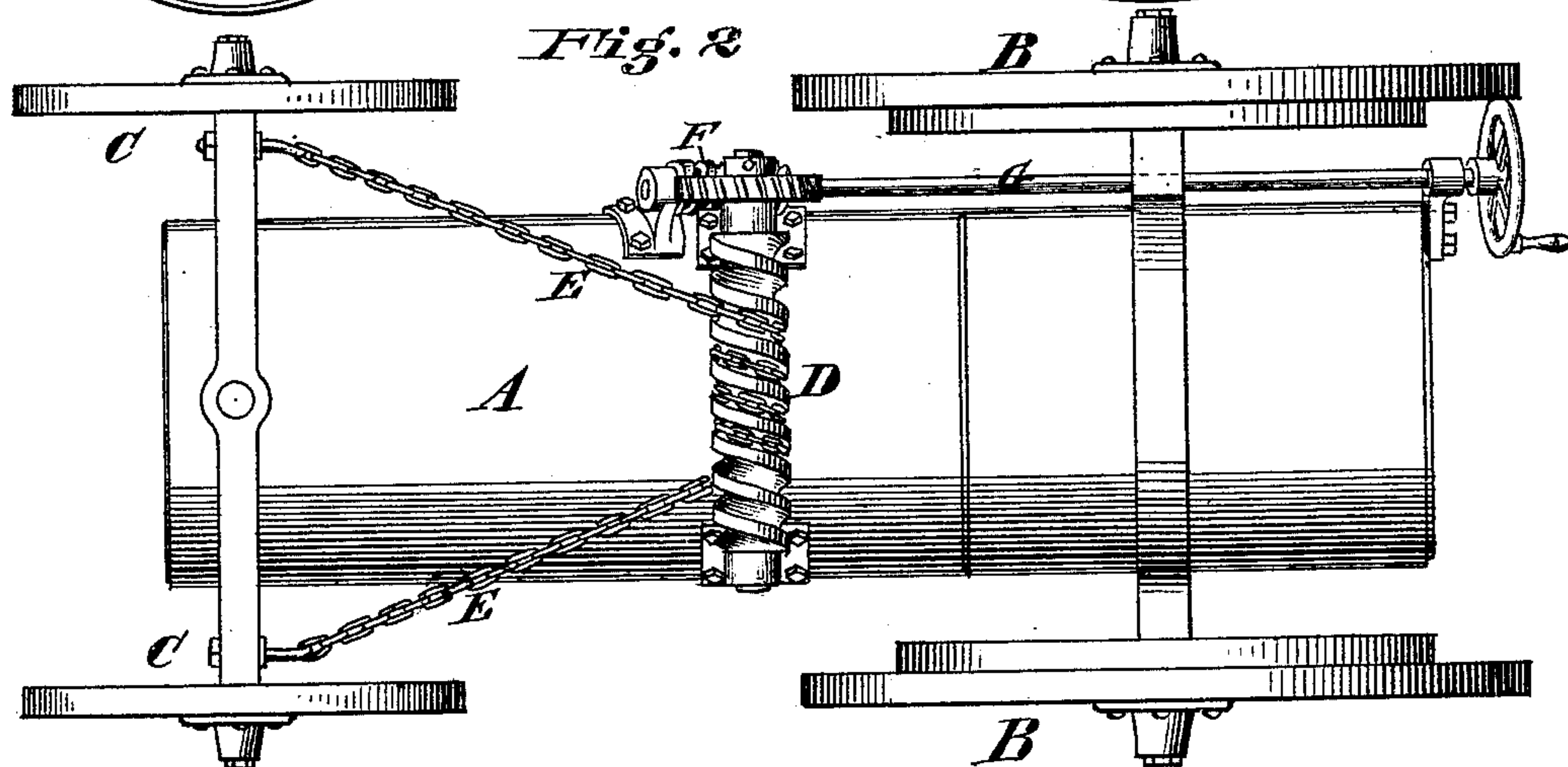
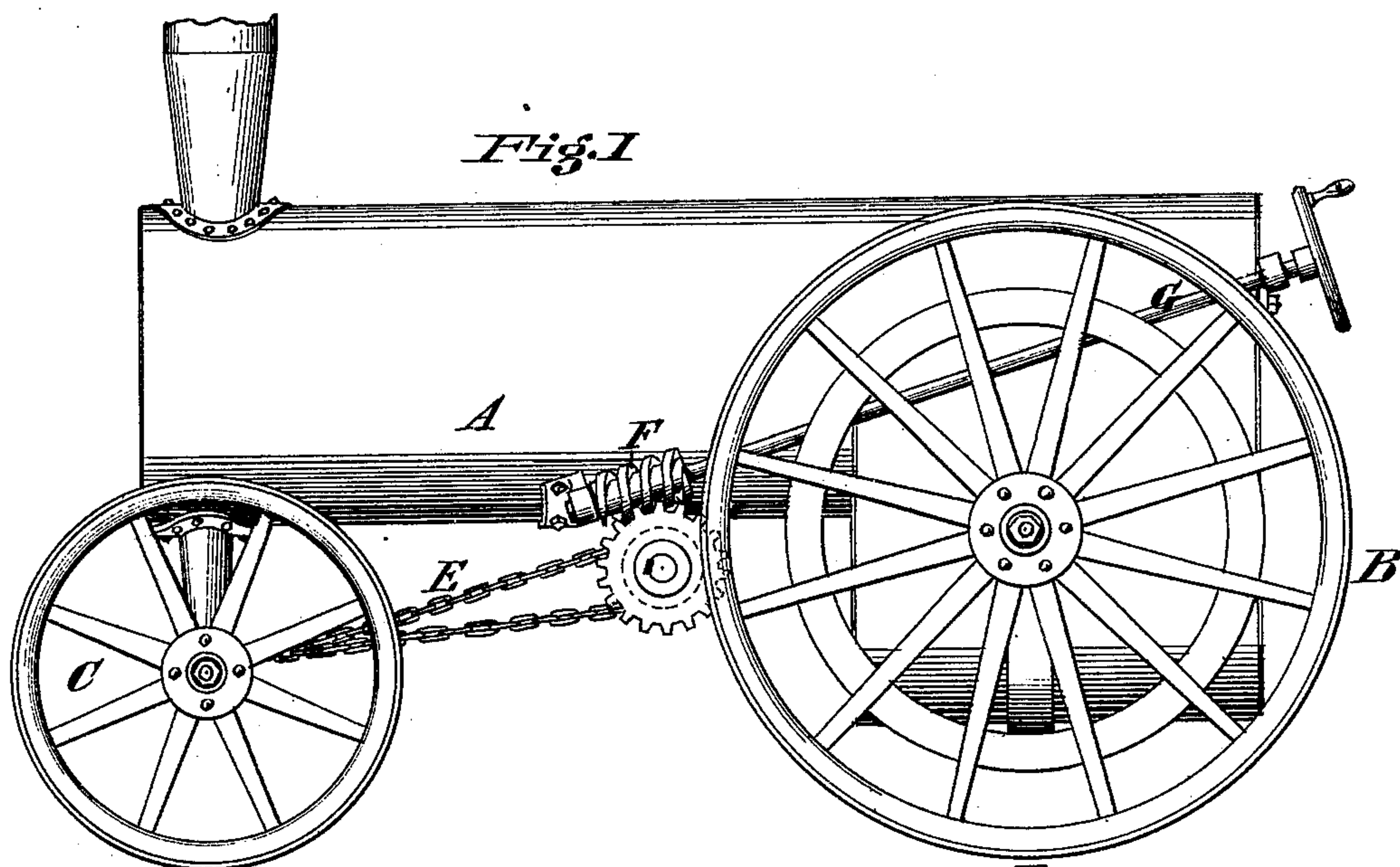


(No Model.)

H. N. LAND & H. CAMPBELL.
Steering Gear for Traction Vehicles.

No. 229,715.

Patented July 6, 1880.



Attest
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UNITED STATES PATENT OFFICE.

HORATIO N. LAND AND HOWARD CAMPBELL, OF RICHMOND, INDIANA.

STEERING-GEAR FOR TRACTION-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 229,715, dated July 6, 1880.

Application filed April 30, 1880. (No model.)

To all whom it may concern:

Be it known that we, HORATIO N. LAND and HOWARD CAMPBELL, citizens of the United States, residing at Richmond, Wayne county, Indiana, have invented new and useful Improvements in Steering Apparatus for Traction-Vehicles, of which the following is a specification.

Our invention relates to the provision of means for steering traction-vehicles under control of the attendant.

Our invention consists in the combination, with the pivoted truck of a traction-vehicle, of a counter-shaft located transversely beneath the vehicle, having thereon a continuous spiral groove between its bearings, and a single chain attached by its ends to the pivoted axle and winding upon the counter-shaft in said grooves, with suitable means for actuating the counter-shaft.

It also consists in the novel construction of said shaft, having reference to the form of the groove, as hereinafter more particularly described.

Figure 1 is a side elevation of a traction or farm engine to which our improvement is applied. Fig. 2 is an inverted plan view of the same, showing the screw-shaft, chain, and connecting parts; and Fig. 3, a detail view, showing the form of the grooves on the winding-shaft.

Similar letters of reference indicate like parts throughout the drawings.

In the drawings, A is the boiler, B the traction-wheels, and C the forward truck, of the machine.

D represents the winding-shaft, secured in suitable bearings transversely beneath the boiler, and actuating a chain, E, wound twice or thrice around it, and secured by its two ends to the pivoted front axle, near its outer extremities.

At one end of the shaft D is a cog-wheel, to which is geared a screw, F, at the end of a shaft, G, rotating in suitable bearings, which extends rearward, and is provided with a hand-wheel or crank within convenient reach of the attendant.

The rotation of the shaft G by the attendant causes the rotation of the shaft D, which thus

winds the chain in one direction or the other, as the case may be, and moves the axle horizontally on its pivot.

The means for rotating the shaft D may be varied at pleasure without departing from the spirit of our invention, which resides, essentially, in the use of a screw-threaded shaft and chain in the manner and for the purpose stated. The shaft is cut externally by a spiral groove, as shown, forming what may be termed a "bastard" or "truncated" screw-thread, with sufficient width between the ridges to permit the alternate links of the chain-cable to lie flatwise upon the bottom of the groove. In the bottom of the groove is cut a narrower groove, of sufficient width and depth to receive those alternate links which occupy planes at right angles to the axis of the shaft.

The advantages thus gained are, the positive and uniform action of the chain and winding-shaft, preventing any slipping of the chain on the shaft or any undue strain upon the chain from its links assuming improper positions in relation to the shaft.

The pitch of the screw-threads will, of course, be determined by the distances apart of the ends of the chain and other circumstances; and, as will be readily understood, when the chain is wound toward either end of the shaft and the axle turned farthest from its normal position the angle of the chain to the winding-shaft will be such as to produce a greater friction against the sides of the shaft-grooves, and thus, by consequence, more firmly retain the axle in positions of greatest strain by preventing the slipping of the chain.

It will be apparent that the actuating mechanism for the shaft may be of any suitable kind, and may be arranged for operation either from the front or rear of the vehicle.

We do not confine ourselves to the precise form of groove described, as a simple groove of rectangular, semicircular, or even V section will secure the benefits of our invention in a degree; or a spiral rib with sprockets, or a spiral line of sprockets, could be employed, provided the same be continuous and adapted to operate with a single chain attached by its ends to the steering-axle; but we deem the double groove as in all respects best for the

purpose for a chain-shaft used in steering the heavy traction-vehicles in which it is contemplated to use our invention.

We are aware that a shaft grooved at its extremities and winding two separate chains attached to the steering-axle has heretofore been used, and such we disclaim.

Having described our invention, we claim and desire to secure by Letters Patent—

10 1. In combination with the pivoted steering-axle of a traction-vehicle, a counter-shaft arranged transversely beneath the vehicle, having thereon a continuous spiral groove between its bearings, winding thereon in said groove a
15 single chain attached at its ends to the axle, with worm-gear or other means for actuating said counter-shaft by the attendant, substantially as specified.

2. In combination with a steering chain-cable arranged and operating in connection with the pivoted truck of a traction-vehicle, for the purpose described, the winding-shaft D, constructed with spiral main and supplemental grooves for guiding and retaining the chain, as set forth. 20

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses. 25

HORATIO N. LAND.
HOWARD CAMPBELL.

Witnesses:

E. H. DENNIS,
M. E. McMEANS.