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N. M. MENDENHALL.

Traction Engines.

No. 144,467. Patented Nov. 11, 1873.

Fig. 3

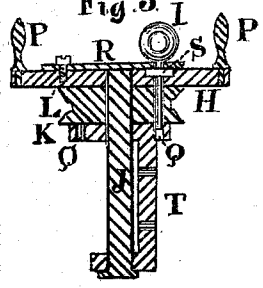


Fig. 4.

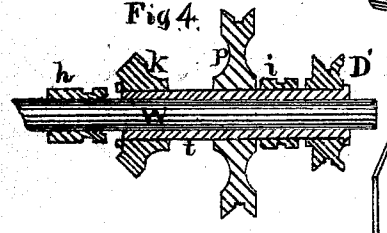


Fig. 1.

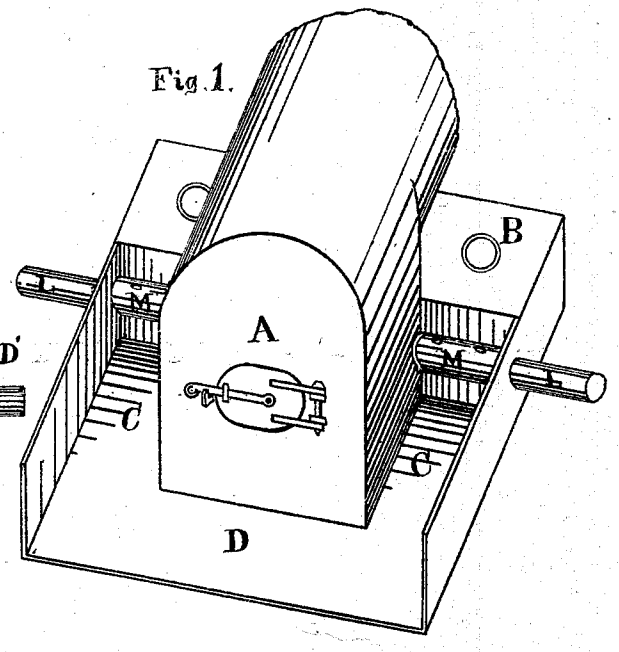
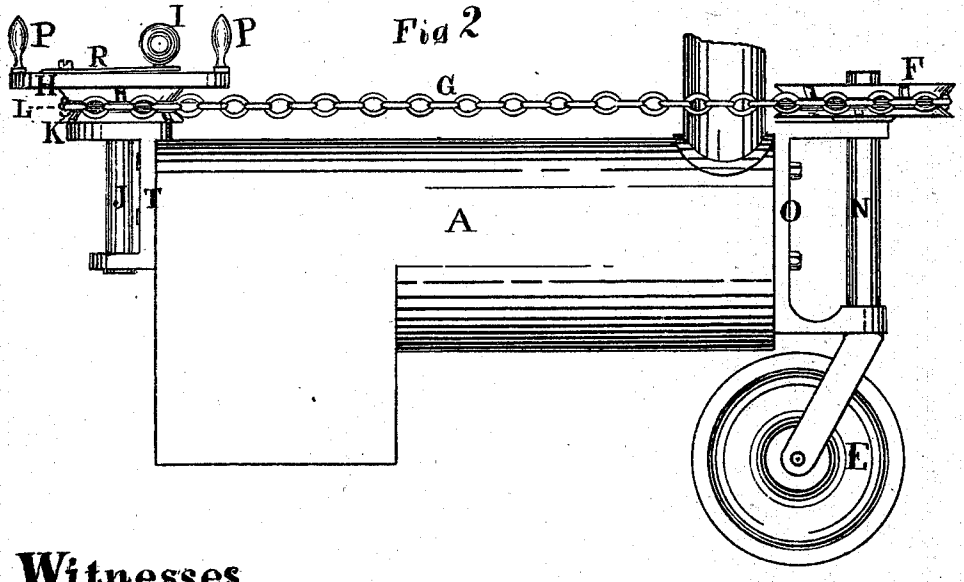


Fig 2



Witnesses

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2 Sheets--Sheet 2.

N. M. MENDENHALL.

Traction Engines.

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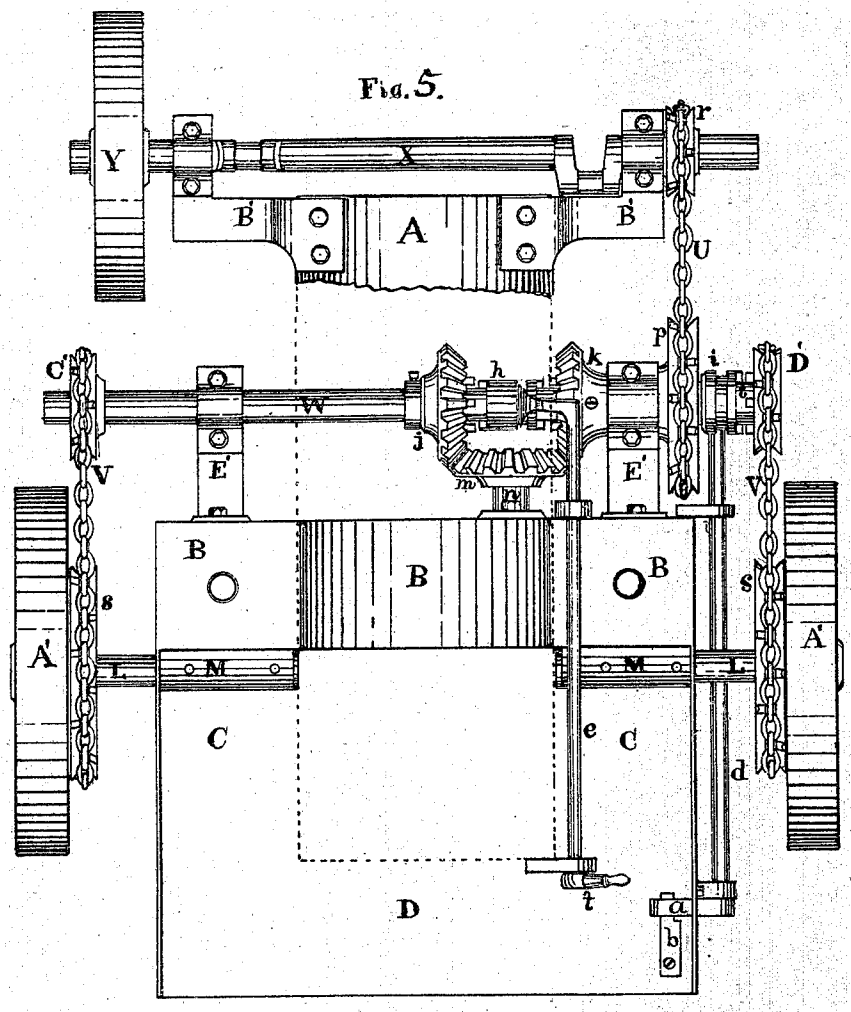
Fig. 5.



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UNITED STATES PATENT OFFICE.

NATHAN M. MENDENHALL, OF DUBLIN, INDIANA.

IMPROVEMENT IN TRACTION-ENGINES.

Specification forming part of Letters Patent No. **144,467**, dated November 11, 1873; application filed September 25, 1872.

To all whom it may concern:

Be it known that I, NATHAN M. MENDENHALL, of Dublin, county of Wayne and State of Indiana, have invented certain Improvements in General-Purpose Engines, of which the following is a specification:

My invention relates to an improvement in general-purpose engines, arranged in such manner as to adapt it to locomotive or stationary purposes with equal facility, and having the tank attached to the boiler in such manner as to prevent freezing. The wheels being firmly attached to the axles, the axles revolve in the bearings independently of each other, allowing each wheel to turn backward or forward, as may be desired, without any reference one to the other, or they may both move forward or backward simultaneously.

Figure 1 is a perspective view of the tank and fuel-boxes attached to the boiler, and showing the bearings M of the axles L of the driving-wheels. Fig. 2 is a side elevation, showing the steering apparatus attached to the caster-wheel E through the chain-belt G. Fig. 3 is a vertical section of the steering apparatus, showing the manner of making the caster-wheel movable or stationary. Fig. 4 is a longitudinal section of the intermediate shaft W with the sleeve *t* attached, and carrying the bevel-wheel *k*, channel-pulley *p*, clutch *i*, and channel-pulley D′. Fig. 5 is a plan or top view, with the rear part of the boiler cut away to show the working-parts of the driving machinery.

A is the boiler, B the tank, C C the fuel-boxes, and D the platform upon which the engineer stands, the whole being mounted on the driving-wheels A′ A″ and the caster-wheel E, said wheel being attached to the upright shaft N, which is supported in place by the stand or bearings O attached to the front end of the boiler, and passes up through the channel-pulley F, which is connected to the channel-pulley L′ through the chain-belt G. The stand T is attached to the rear end of the boiler, and has a circular plate or disk, K, attached to its upper end. This circular plate has a series of holes, Q, around its outer edge to receive the lower end of the stud I, which holds the channel-pulley L′ from turning when it is desired to have it stationary. This stud I has an elongated head, S, shown in Fig. 3; also a neck and loop extending above the head S. To this neck a spring, R, is attached, and is also fastened to the lever H, said lever being attached to the channel-pulley L′, the whole being supported on the upright shaft J. There is a slot or groove cut in the upper side of the lever H, into which the elongated head S falls, and is held in place by the spring R when it is desired to make the caster-wheel stationary; but when it is desired to steer the engine by means of the caster-wheel through the chain-belt, the stud I is raised up and the head S turned across its slot, and consequently the lower end is raised out of the hole in the circular plate K, and the whole plays around freely, and may be left to adjust itself, or may be governed by the hand of the engineer on the handles P of the lever H. When it is again desirable to hold the caster-wheel stationary, the engineer simply turns the stud I until its head, S, drops into its slot in the lever H, where it is held by the spring R, and the caster-wheel is secured in a stationary position through the chain-belt G.

The driving-wheels A′ A″ are attached firmly to their axles, L, the axles revolving in the bearings M, which are firmly attached to the fuel-boxes. This arrangement allows one wheel to move forward and the other backward at the same time, when it is desired to make a short turn. By allowing the caster-wheel free play it adjusts itself to the circle that is being made. Thus it will be seen that there may be three points upon which the whole machine turns. If it is desired to turn to the left, the left driving-wheel is stopped and the caster-wheel allowed free play; the right driving-wheel being put in motion turns the machine to the left, the left wheel being the pivot or center upon which the whole machine turns. If it is desired to turn to turn to the right, the operation is reversed.

I use double engines without a fly-wheel, which allows me to stop quickly, if desired, when using the engine for locomotive purposes. For stationary purposes, I attach the band-wheel Y to the double-crank shaft X. Thus it may be readily converted into a stationary engine either by throwing out of gear the clutches *h* and *i*, or removing the driving chain-belt U.

B′ B′ are the bearings attached to the front

end of the boiler to support the double-crank shaft X. The channel-pulley *r* on the crank-shaft connects with the pulley *p* on the sleeve *t* through the chain-belt U. The channel-pulleys C′ and D′ connect with the pulleys *s s* on the driving-wheels through the chain-belts V V, the whole being geared backward, to give about four revolutions of the crank-shaft X to one of the driving-wheels.

The operation is as follows: In handling the engine for locomotive purposes the engineer stands on the platform D. If he wishes to turn to the left, he raises the stud I out of the hole in plate K, giving the caster-wheel free play. He then takes hold of the handle *t* of the rocking-lever *e*, and slides the clutch *b*, which works on a feather, out of gear, which stops the left driving-wheel, and allows the right wheel to remain in gear, which carries the engine around to the left, the left wheel being the center or pivot on which it turns. If he wishes to turn to the right, he places his foot on the lever *a* of the rocking-lever *d*, which moves the clutch *i* out of gear, and stops the right wheel and allows the left wheel to revolve, and, consequently, turns to the right. When he wishes to move on, he has only to remove his foot from the foot-lever *a*, when the spring *b* throws it up, and replaces the clutch *i* in gear with the channel pulley D′, and he moves on as before. If he wishes to make a shorter turn, he has only to shift his clutches so as to make one driving-wheel move backward and the other forward, according to the direction he wishes to turn, and the center upon which he turns is transferred to the middle of the boiler between the driving-wheels. Thus he turns in a less space than the length of his engine, which is very desirable in plowing and other purposes for which the engine may be used.

Many modifications of the above-described construction may be made. Gear-wheels may be substituted for the chain-belts; and the arrangement of the intermediate shaft W, bevel-gears, and sleeve may be replaced by an intermediate shaft in two pieces, hung in suitable boxes for shifting, and a short upright shaft, with two bevel-gears attached, may be introduced between the ends of the intermediate shafts so constructed. And the inner ends of the intermediate shafts, having bevel-gears to mesh in the gears on the upright shaft, may be shifted up or down, according to the direction it is desired to drive the driving-wheels, either backward or forward, as in the above-described arrangement.

Thus it will be seen that this engine is adapted to general purposes, plowing, traveling on common roads, and locomotive purposes generally; and may be converted into a stationary engine for thrashing, sawing, or any purposes whatever for which a stationary engine can be used by simply detaching the driving-wheels from the engine.

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

1. The combination of the intermediate shaft W, bevel-wheels *j k m*, sleeve *t*, clutches *h* and *i*, the channel-pulleys *s s*, driving-wheels A′ A′, pulley C′ on the intermediate shaft W, pulley D′ on the sleeve, and the chain-belts V V, substantially as set forth.

2. In combination with the elements embraced in the foregoing clause, clutches *h* and *i*, whereby one or both the driving-wheels may be stopped without stopping the engine.

3. The intermediate shaft W, carrying the sleeve *t*, having the bevel-wheel *k*, channel-pulley *p*, clutch *i*, and channel-pulley D′, in combination with the channel-pulley *r* on the crank-shaft X, and the pulley *s* on the driving-shaft L, substantially as set forth.

4. The combination of the foot-lever *a*, spring *b*, and rocking-lever *d* with the clutch *i* and channel-pulley D′, whereby the driving-wheel A′ may be stopped and started at will, substantially as set forth.

5. The combination of the grooved pulleys L′ and F, chain-belt G, circular plate K, lever H, stud I, spring R, and caster-wheel E, whereby said caster-wheel may be guided or held stationary at will, substantially as set forth.

NATHAN M. MENDENHALL.

Witnesses:
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