

(No Model.)

2 Sheets—Sheet 1.

R. H. AVERY, Dec'd.

F. R. AVERY, Administrator.

ROAD ENGINE.

No. 537,263.

Patented Apr. 9, 1895.

Fig. 1

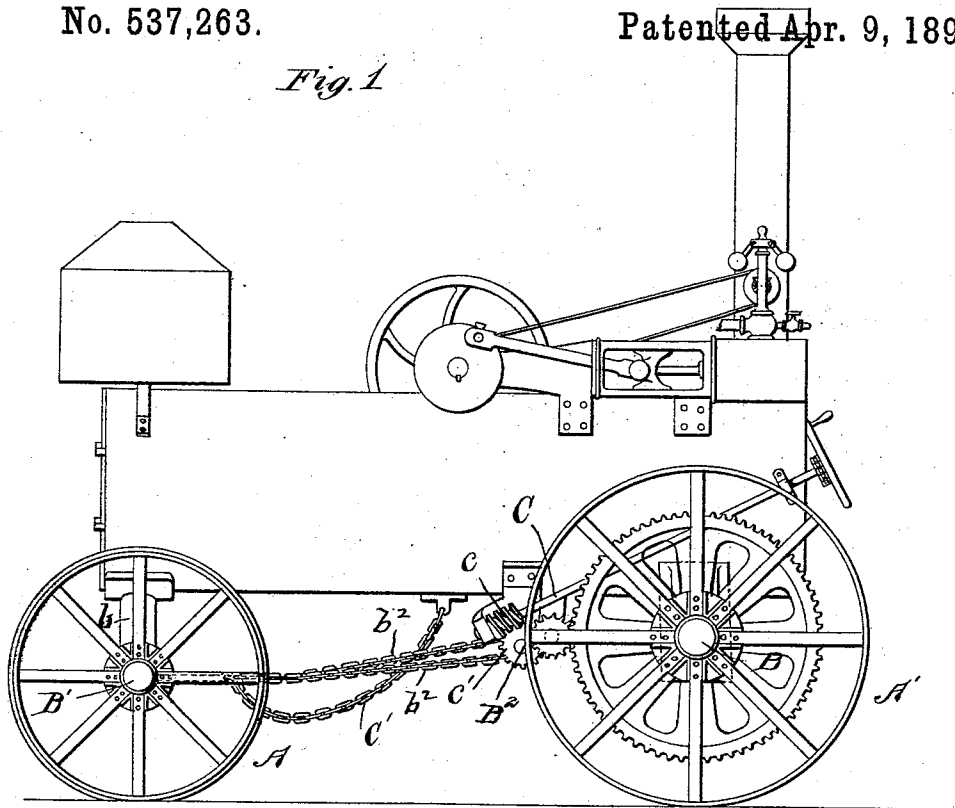
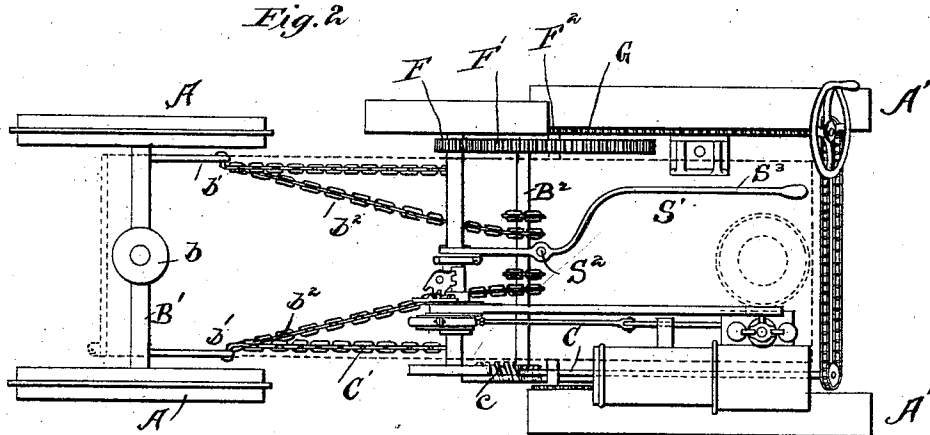


Fig. 2



Witnesses.

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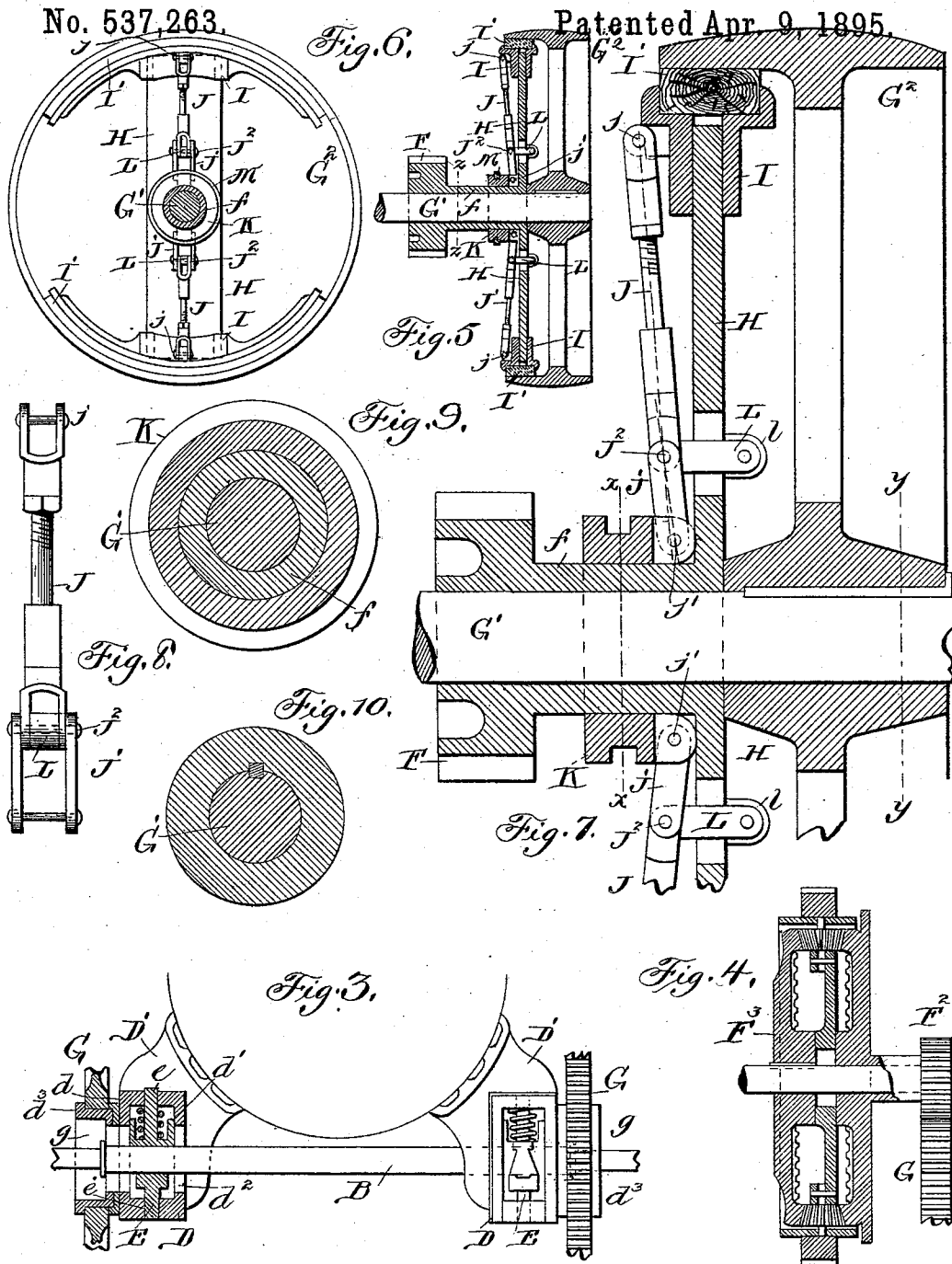
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Witnesses;

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UNITED STATES PATENT OFFICE.

FREDERIC R. AVERY, OF PEORIA, ILLINOIS, ADMINISTRATOR OF ROBERT H. AVERY, DECEASED.

ROAD-ENGINE.

SPECIFICATION forming part of Letters Patent No. 537,263, dated April 9, 1895.

Application filed May 8, 1893. Serial No. 473,480½. (No model.)

To all whom it may concern:

Be it known that ROBERT H. AVERY, deceased, late a citizen of the United States, residing at Peoria, county of Peoria, State of Illinois, and of whose estate FREDERIC R. AVERY, of Peoria aforesaid, is now the administrator, has heretofore invented new and useful Improvements in Portable Engines, of which the following is a specification, reference being had to the accompanying drawings, wherein—

Figure 1 is a side elevation of a traction engine embodying the improvements. Fig. 2 is a plan view showing some of the parts which are above the boiler and some which are below it, the outlines of the boiler being indicated by dotted lines. Fig. 3 shows the rear axle, the devices whereby the boiler is held thereon, and parts of the gearing. Fig. 4 is a section of the compensating gear. Fig. 5 shows a section of the fly wheel and the clutch. Fig. 6 is a section on the line zz Fig. 5. Fig. 7 is an enlargement of part of Fig. 5. Fig. 8 shows one of the toggle levers detached. Figs. 9 and 10 are sections on lines xx and yy of Fig. 7.

In the drawings an engine is shown which in some respects is similar to those heretofore in use. The boiler and attached parts are mounted upon the front wheels A and the rear wheels A'; B' indicating the front axle and B the rear axle to which the wheels at the front and the rear are applied. The front axle B' is connected to the boiler above it by means of downwardly extending pivot or hinge devices at b which may be of the ordinary form.

B² is the chain winding or wrapping shaft of the steering mechanism.

b' are levers or bars secured directly to and extending back from the axle.

b^2 , b^2 are chains relatively short, in comparison with those ordinarily used and secured at the front ends to the said levers or bars b' and at their rear ends to the winding shaft B². The shaft B² is rotated by the inclined shaft C which has a handle within reach of the engineer and a worm c at its lower end engaging with the worm wheel c' on the shaft

B². The movements of the front axle B' are limited by stop chains C'. These are independent of the draft chains b^2 and at their front ends are secured to the aforesaid levers or bars b' and the fastening devices secured to the boiler near its side lines.

With the devices described greater power can be applied to the front axle than with the ordinary steering devices of traction engines, as the levers b' bring the draft of the chains b^2 to bear on lines running to points more remote from the central longitudinal vertical plane of the engine than when the chains are applied directly to the axle; and the independent stop chains C' provide a definite predetermined limit for the swing of the axle so that it cannot get beyond a line where it can be easily controlled by the engineer.

I am aware of the fact that vehicles have been constructed with truck frames above the front axles to which frames chains were applied; but I believe the said ROBERT H. AVERY to have been the first to have mounted the boiler of a traction engine of this class by means of a swiveling or pivoting connection directly upon the axle, and to have applied to said axle levers extending back therefrom, with draft chains and independent stop chains connected to said levers.

The rear axle B is mounted in guide boxes D which are cast integral with bracket plates D' bolted to the boiler. Each box D is formed with an inner wall d' and an outer wall d having passage or guide ways d^2 for the axle. In the chamber in the box D there is a sliding box or bearing E having an angular aperture through which passes the angular axle B. The chamber in the guide D is large enough to permit of considerable vertical play of the box E. Between the box and the top of the guide there is a coiled spring which receives the weight of the boiler and engine and provides a yielding carrier for it upon the axle and wheels. The spindles project through the boxes and the wheels are mounted thereon outside. To the outer faces of the boxes are secured hollow bearings g having vertical flanges d^3 . Upon these bearings are placed the main gear wheels G which transmit the power to the

ground wheels, being connected to the latter in any of the well known ways.

Each bearing or box E has guide arms ee' , one seated in an aperture in the top of the guide box D and the other in an aperture in the bottom. The boiler, the gear wheels G and engine can rise and fall independent of the axle and the ground wheels, the wheels G being held in place by the flanges d^2 . The crank shaft G' is connected to the ground wheels by the wheels F, F' , F^2 , F^3 , of any suitable sort. The compensating gearing at F^3 drives the pinions F^2 F^2 simultaneously or independently in the well known way. The main pinion F is mounted loosely upon, or with relation to, the crank shaft or driving shaft G' , but can be rotated therewith by means of a clutch. A friction clutch is shown which is preferably constructed and arranged in relation to the other parts as follows: As shown the pinion F is cast with a sleeve f which is loose on the shaft G' . H H are plates or arms also held loosely upon the shaft, being preferably cast integral with the sleeve f , and serving both as guides and braces for the friction shoes and as a carrier for some of the parts which limit the movements of the shoes. The shoes are indicated by I I. In order to balance their thrust they are placed diametrically opposite relatively to the axis of the shaft. Each has a passage to receive one of the guide or carrier arms H, and has a peripheral groove in which is seated the wooden grip piece I'. J J' are toggle levers. As shown there are two of these each interposed between one of the shoes I and a sliding collar K. The part J is pivoted at j to the shoe, the part J' is pivoted to the collar at j' , and the adjacent ends of the two parts J and J' are joined by a pivot at J^2 . The collar K has a peripheral strap or ring M secured thereto and to the latter is applied a shipping lever which extends to a point within reach of the operator, and by means of which he can move the collar along the shaft. When he moves it toward the driving friction wheel G^2 (ordinarily the fly wheel of the engine), the parts J and J' of each toggle lever approach a straight line, which results in moving the shoe I out radially and brings it into frictional engagement with the wheel G^2 ; and the said parts of each lever and its pivotal points j j' and J^2 are so related that the shoe is gradually brought into engagement with great power, and when the said pivotal points are in the same line, the shoe is practically locked with a positive engagement with the friction wheel, and such locking is retained even though the point j' be slightly out of the line of the pivots at j and J^2 . A stop is provided for the collar K to limit its movement outward, and which ar-

rests it just after the pivot at j' has passed the line aforesaid, the stop, as shown, being the guide or carrier H.

In order to limit, or properly define the movements of the two parts J and J' of the toggle lever relatively to each other, a link L is employed which is pivoted at one end, at J^2 , and at the other is pivoted to the shoe carrier, preferably by means of ears l , as shown in the drawings. This link insures that the parts J and J' shall not be displaced, and that the shoe shall move properly on the guide or carrier H. When the collar K is at the outer end of its movement and bearing against the stop, the pivot j' being as aforesaid in or a little beyond the line of the pivots at j and J^2 , the shoes will be held permanently and practically rigidly against the rim of the fly wheel, even after the operator withdraws his hand, giving largely the same effect as if a positive clutch were used instead of a friction clutch.

What is claimed is—

1. In a traction engine, in combination with the ground traction wheels, the crank shaft adapted to rotate continuously, the fly wheel keyed thereto, the gearing intermediate of said shaft and the ground wheels and adapted to be intermittently actuated by the momentum of the fly wheel, the pinion F loose on the crank shaft and having the sleeve f and the radial guide bars H integral therewith, the collar K sliding on said sleeve, and the friction shoes engaging with the fly wheel, the toggle levers each having the parts J, J' pivoted together and respectively pivoted to the shoe and to the collar K, and the links L pivoted to the bars H and to the lever parts J, J', said links and levers being arranged substantially as set forth, whereby they can be stationary with the pinion and the shoes independently of the continuously rotating shaft.

2. In a traction engine, the combination with the horizontally arranged boiler, the steering axle B' below the boiler, the pivotal connecting devices extending downward from the boiler to the axle, the horizontal chain winding shaft below the boiler, the steering chains b^2 engaging with said shaft, the stop chains C' independent of the draft chains, and the levers or bars b' secured directly to the axle and extending back therefrom and connected to the steering chains and the stop chains, substantially as set forth.

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

FREDERIC R. AVERY,
Administrator of Estate of Robt. H. Avery,
Deceased.

Witnesses:

F. H. TICHENOR,
W. N. KILBOURN.