

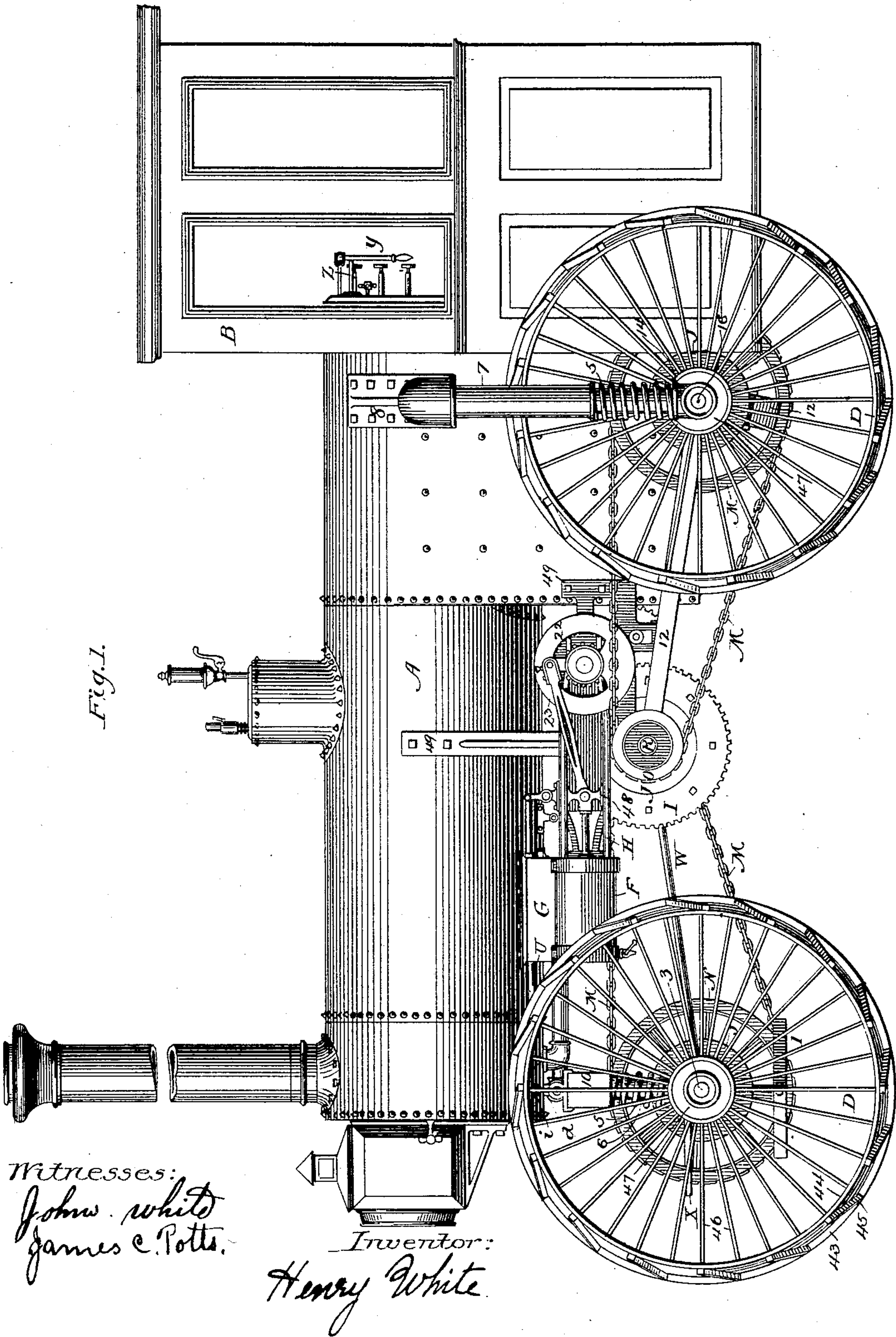
(No Model.)

3 Sheets—Sheet 1.

H. WHITE.
ROAD LOCOMOTIVE.

No. 480,757.

Patented Aug. 16, 1892.



Witnesses:
John W. White
James C. Potts.

Inventor:
Henry White.

(No Model.)

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Fig. 3.

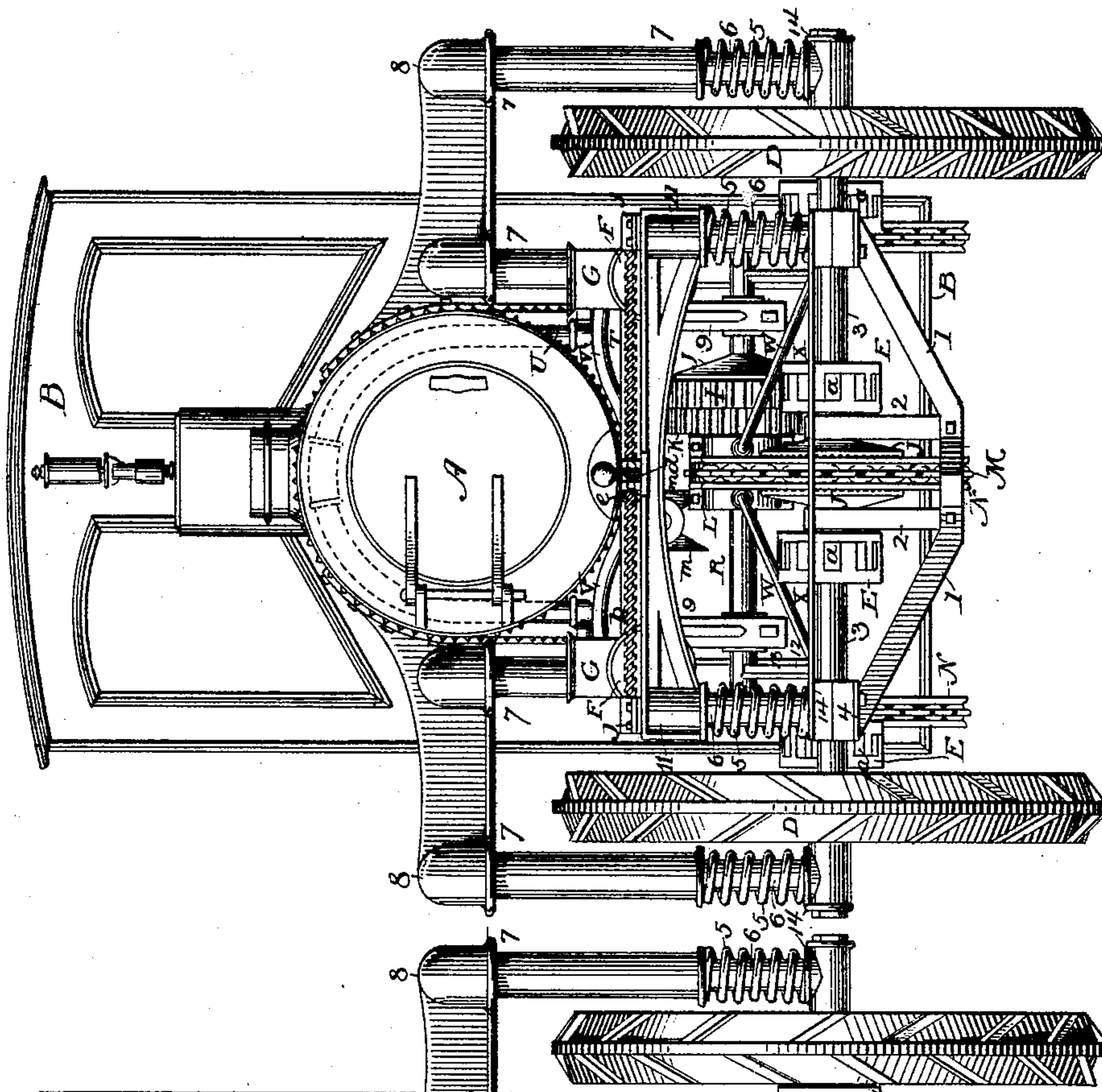
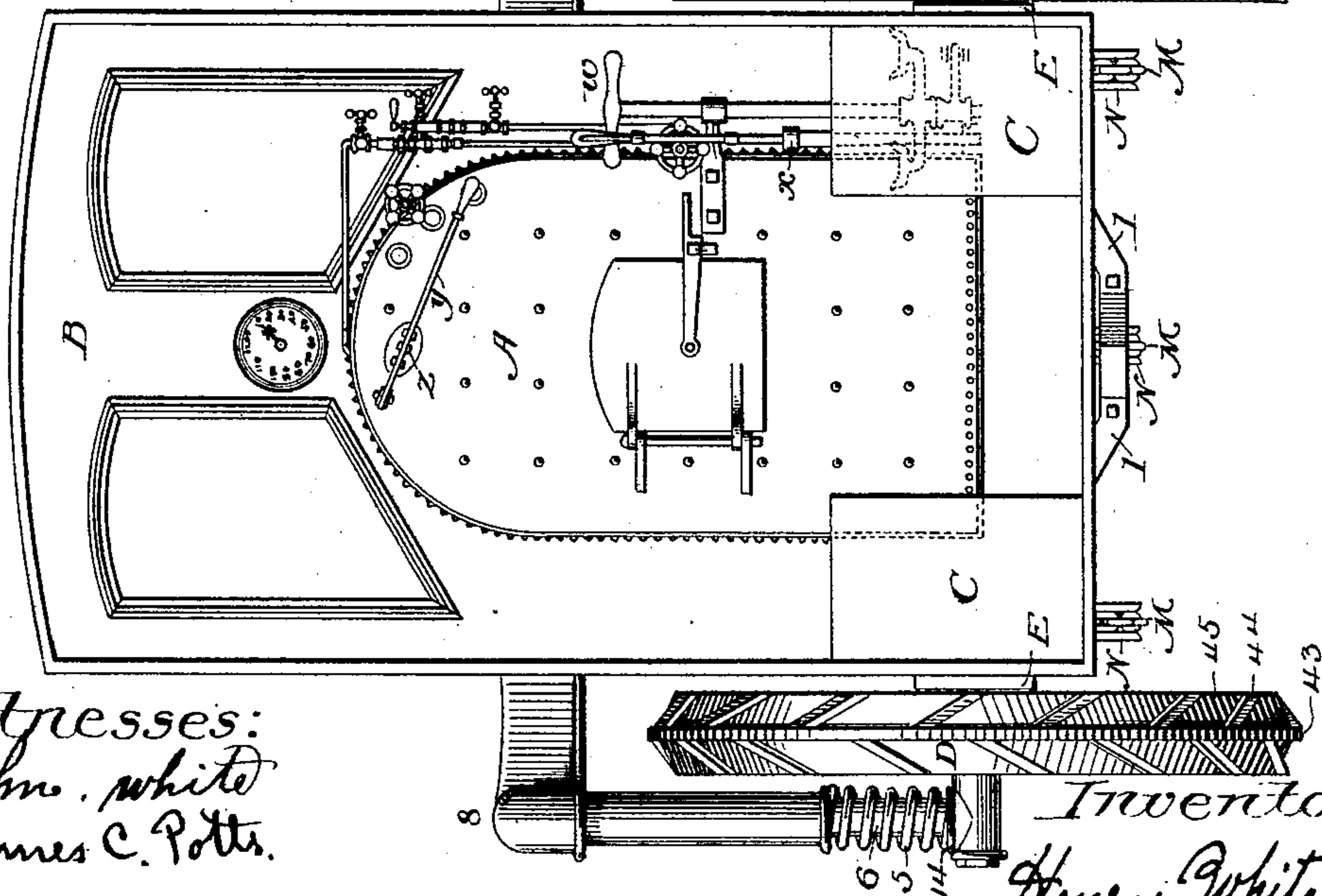


Fig. 2.



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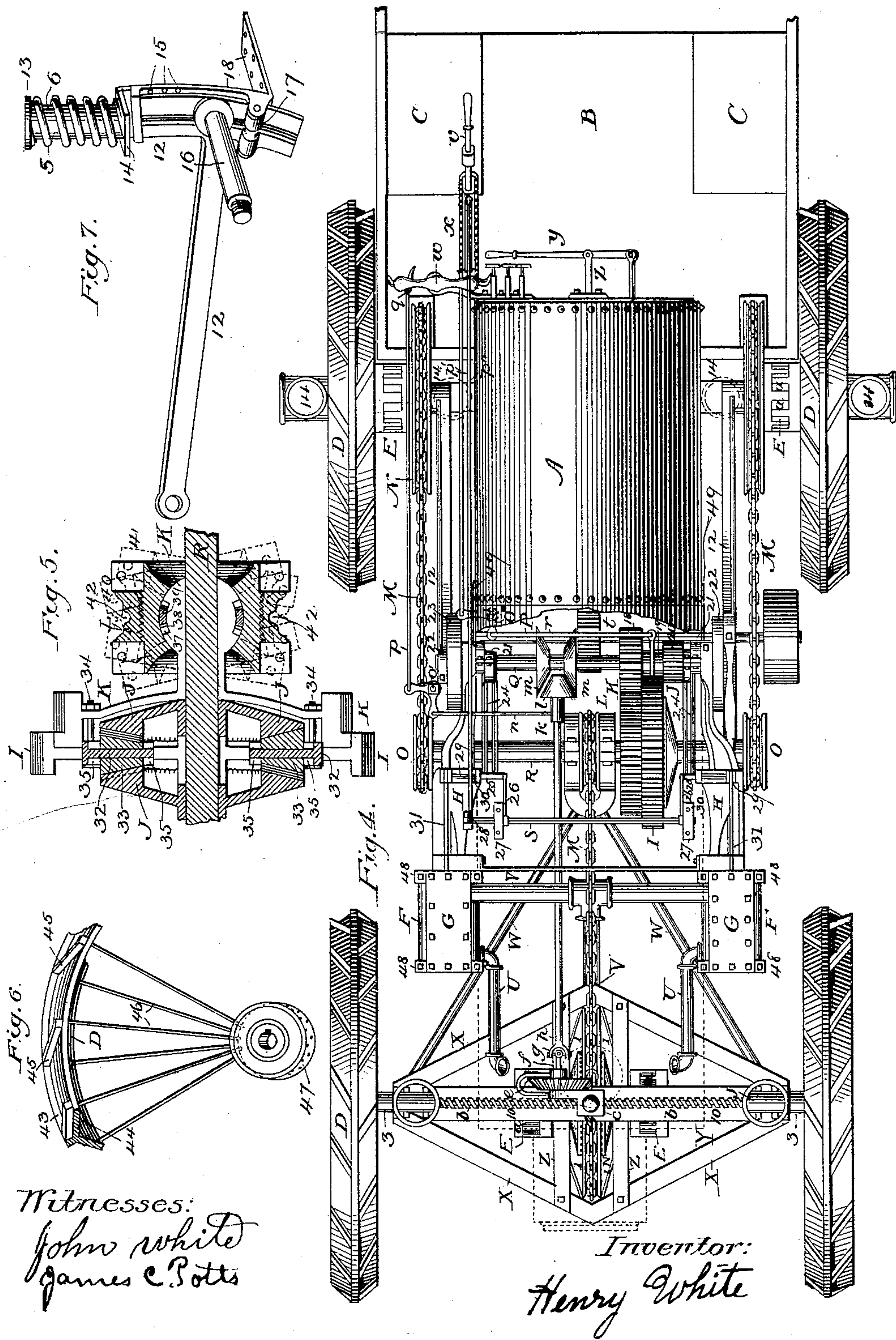
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UNITED STATES PATENT OFFICE.

HENRY WHITE, OF BELLVILLE, OHIO.

ROAD-LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 480,757, dated August 16, 1892.

Application filed January 31, 1891. Serial No. 379,857. (No model.)

To all whom it may concern:

Be it known that I, HENRY WHITE, a citizen of the United States of America, residing at Bellville, in the county of Richland and State of Ohio, have invented a new and useful Road-Locomotive, of which the following is a specification.

My invention relates to improvements in road-locomotives in which the motive power is applied to all four wheels, and the effects of my improvements are, first, to equally apply the motive power to all four wheels in any position that the locomotive is expected to take; second, to insure the perfect tracking of the drive-wheels when turning as well as when going straight forward or backward; third, to provide for ease and certainty of management; fourth, to reduce the top weight and balance the locomotive correctly; fifth, to secure the greatest economy of power on all kinds of roads; sixth, to remove all concussion caused by sudden motion of the engine from machinery; seventh, to provide for the transmission of the power to the drive-wheels, so that the action of the boiler on the springs does not bind the gearings. I attain these objects by the mechanism illustrated in the accompanying (already filed) drawings, of which—

Figure 1 is a side elevation of the entire machine. Fig. 2 is a rear view, and Fig. 3 is a front view. Fig. 4 is a top view with the boiler removed to show working parts. Fig. 5 is a sectional view of ball-joint coupling and the adjoining compensating gear. Fig. 6 is a sectional view of the drive-wheels. Fig. 7 is a perspective view of spindle connection and spring-slide.

Similar letters and numerals refer to similar parts of the machine.

The boiler A, to which is attached cab B, with water-tanks C C, is mounted on drive-wheels D D D D by means of cast-steel bolsters, (designated by figure 8 in the rear and 10 in front,) into which rear bolster are inserted four pieces of gas-pipe 7, (circular tubes 11 in front bolster 10 answering the same purpose,) and into these larger pipes smaller ones 6 are loosely inserted, and around these the springs 5 5 5 5 vibrate, the cups 14 forming the points of resistance on axles.

The tire 44 of drive-wheels D D D D is V-shaped with rim 43 in center, with or without spurs 45, so that there will be as little friction as possible upon the ground when curbing.

The coupling of the rear and front trucks is effected by bars 12 from spindle 16, connected to shaft R, and by the brace-rods W W, extending from the center of shaft R to front axle 3. The break of the coupling is at shaft R, which is midway between the rear and front axles, thereby insuring perfect tracking of the drive-wheels at all times.

The steam is taken from top of dome by a dry pipe passing downward and forward, where it is operated upon by throttle Z, connected to lever Y, then forward through the boiler-plate into and down through the smoke-box (indicated by dotted lines in Fig. 3) to the outside of the boiler, where it passes backward through pipe U and enters steam-chest and cylinder and escapes through exhaust-pipe V. The cylinder consists of heads 48, into which is screwed barrel F, and bolted thereto is steam-chest G. Bed-plate H is of Corliss pattern and is held in place by brackets 49. Crank 23 transmits power from piston to disk 22, which is keyed on shaft Q, mounted on brackets 49. On shaft Q is double pinion 18 and 20, connected by sleeves 19, which is movable, and when a slower speed is required than is attained by the union of spur-wheels 18 and K the double pinion 18 and 20 is shifted to the right or toward friction-bevel until spur-wheel 18 is released and spur-wheel 20 engages spur-wheel I. Inserted in spur-wheel I are compensating bevels 33, Fig. 5, which, with large bevel-gears J J, form the compensating gear which acts upon sprocket-wheels O O, shaft R communicating on one side and a loose sleeve around shaft R on the other equalizing the application of the power to the rear driving-wheels. On the side of spur-wheel I, and bolted firmly thereto, inclosing half of compensating-gear, is spur-wheel K, with ball-and-sleeve connection on ball k, which is cast solid with spur-wheel K, on which is mounted sprocket-wheel L, which is the same size as sprocket-wheels O O. In ball k, parallel with shaft R, is slot 37, into which from sprocket-wheel L, stud 39, around which is anti-friction roller 38, which

reduces friction. A similar stud and roller are also on opposite sides of ball *k* as sprocket-wheel is brought by the coupling connection into the different positions required to keep it in perfect line with front sprocket-wheel N when the wheels pass over obstructions and in turning. (Fig. 6 dotted lines shows different positions of sprocket-wheels L upon ball *k*, above referred to.) The power is transmitted from sprocket-wheel O on shaft R to sprocket-wheel N by chain M. Sprocket-wheel N is attached to hubs inside of the rear traction-wheels D D and communicate with said traction-wheels through rubber-cushion wheel E.

Cushion-wheels E E E E each consist of two similar disks, each disk having three clutch radial projections. Each pair of disks are placed together with their projections inward and alternating each other with wedge-shaped rubber filling the space between projections of disks on rear traction-wheels D D. One disk is firmly held to the hub of traction-wheel D D, the other disk is secured to sprocket-wheel N. In front one side of disk is secured to compensating bevel-wheel 1, while the other disk is keyed to axle 3. The object of these cushion-wheels is that when front traction-wheel D passes over any obstruction the gain is held in cushion-wheel E until rear traction-wheel passes over the same, which is necessarily the case. As the engine is a perfect tracker, the pressure is again equalized.

Steering-bar *w* is provided with a cross-head or hand-wheel at top and below. Near floor of cab is a convenient cross-bar (shown by dotted lines) keyed to perpendicular bar to place the foot against for the purpose of operating a reversible steering device.

Spindle connection and spring-slide for rear traction-wheels are shown in Fig. 7. Spindle 16 is made solid with bar and slide 12. Bar 12 extends to and around shaft R. This will give true center with sprocket-wheels N O in any position of spring 5. Bracket 18 is bolted to boiler.

15 17 are anti-friction rollers.

Sprocket-wheel N on the front axle occupies the same position in the compensating-gear to equalize the power applied to the front drive-wheels as spur-wheel I occupies in Fig. 5. Bevel-gears J J are each cast solid with the inner half of cushion-wheel E, the outer half being keyed to axle 3, which connects with the drive-wheels D D. Driving-axle 3 is disconnected in the center and is

supported by a truss-bar Z Z in cushion-wheel E or so arranged as to remove all concussion occasioned by a sudden motion of the engine. By shifting spur-wheel 18, which is connected to spur-wheel 20 by sleeve 19, to the right or toward friction-bevel M until it engages spur-wheel *t* on shaft P, gives motion to band-wheel *w'* for driving saw-mills, thrashing-machines, &c.

Shaft P, with band-wheel *w'*, may be removed when not needed, thereby reducing the weight of the locomotive when used exclusively on the road. By a shifting motion of sleeve K bevel *l* can be brought into contact with either one of the bevels M M on shaft Q, thereby giving motion to shaft *h*, and likewise to bevel-gear *e*, which engages bevel-gear *d*. Gibbed to bolster 10 is shifting-block *c*, Fig. 5, upon which boiler A is mounted and held in place by ball in socket *i* and in which is inserted bevel-gear *d*, threaded to fit spiral screw *b*, around which it rotates, shifting boiler A on bolster 10. By thus shifting the boiler back and forth the operator can produce a straight line or any required curve.

I am aware that prior to my invention road-locomotives have been constructed with the power applied to all four wheels. I therefore do not claim this point, broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a road-locomotive, of sprocket-wheel L with coupling-joint on ball *k*, all substantially as set forth.

2. In a road-locomotive, the combination of boiler A on shifting-block *c* with spiral screw *b*, around which bevel-gear *d* is made to rotate by steam-power for the purpose of steering, substantially as set forth, for the purpose specified.

3. The wheel D, having the tire 44, provided with rim 43, and spur 45, all as set forth.

4. The combination, in a road-locomotive, of cushion-wheel E with rubber cushions *a* on drive-wheel axles, substantially as set forth, for the purpose specified.

5. In a road-locomotive, the combined hand and foot lever provided with cross-bars and capable of rotary motion about an axis, in combination with gear-shifting devices for directing the course of the locomotive, as set forth.

HENRY WHITE.

Witnesses:

ALBERT O. LEEDY,
OTIS HOWARD.