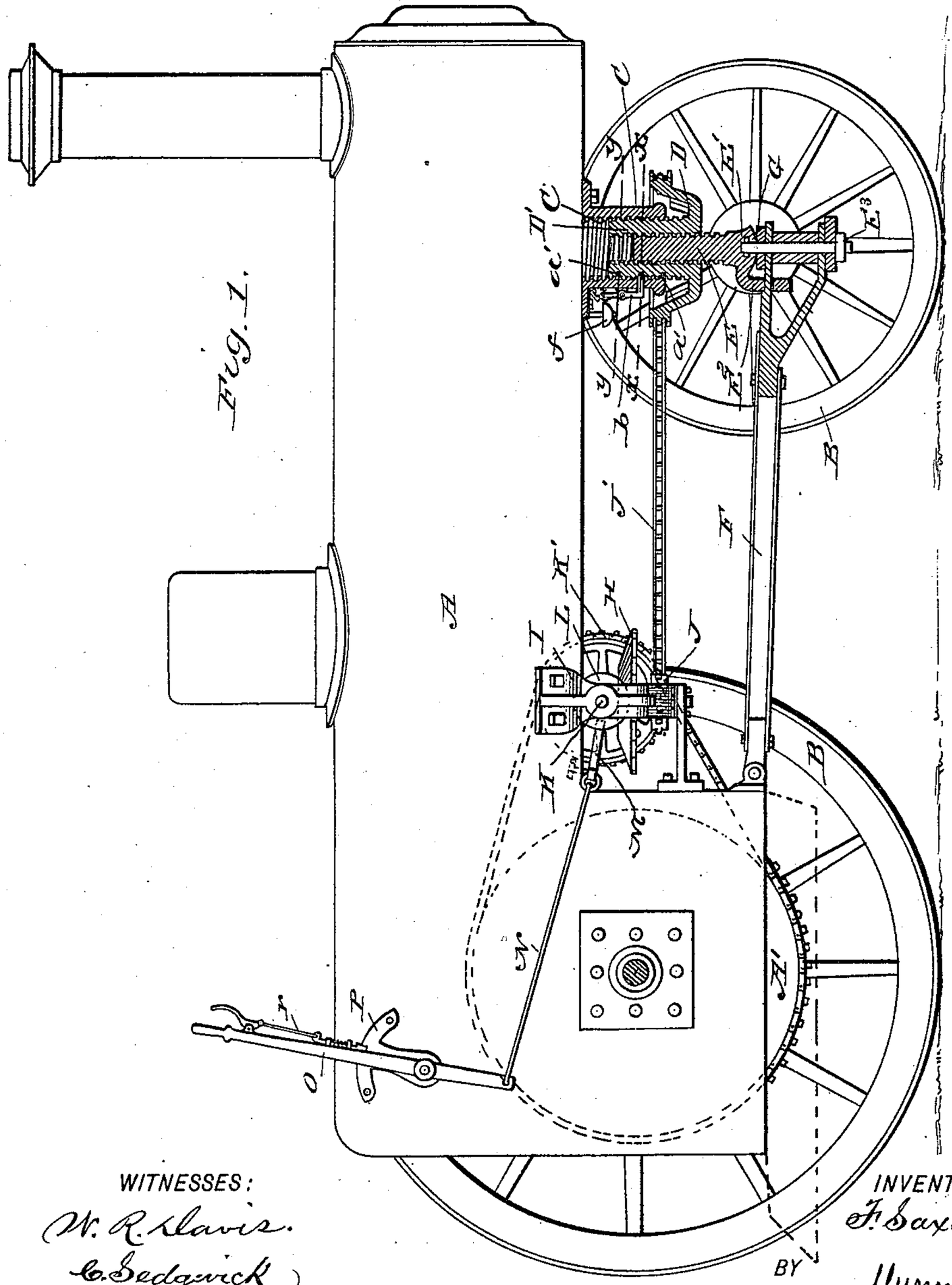
(No Model.) 3 Sheets—Sheet 1.

F. SAXON.

BOILER LEVELING DEVICE FOR ROAD ENGINES.

No. 436,267. Patented Sept. 9, 1890.



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

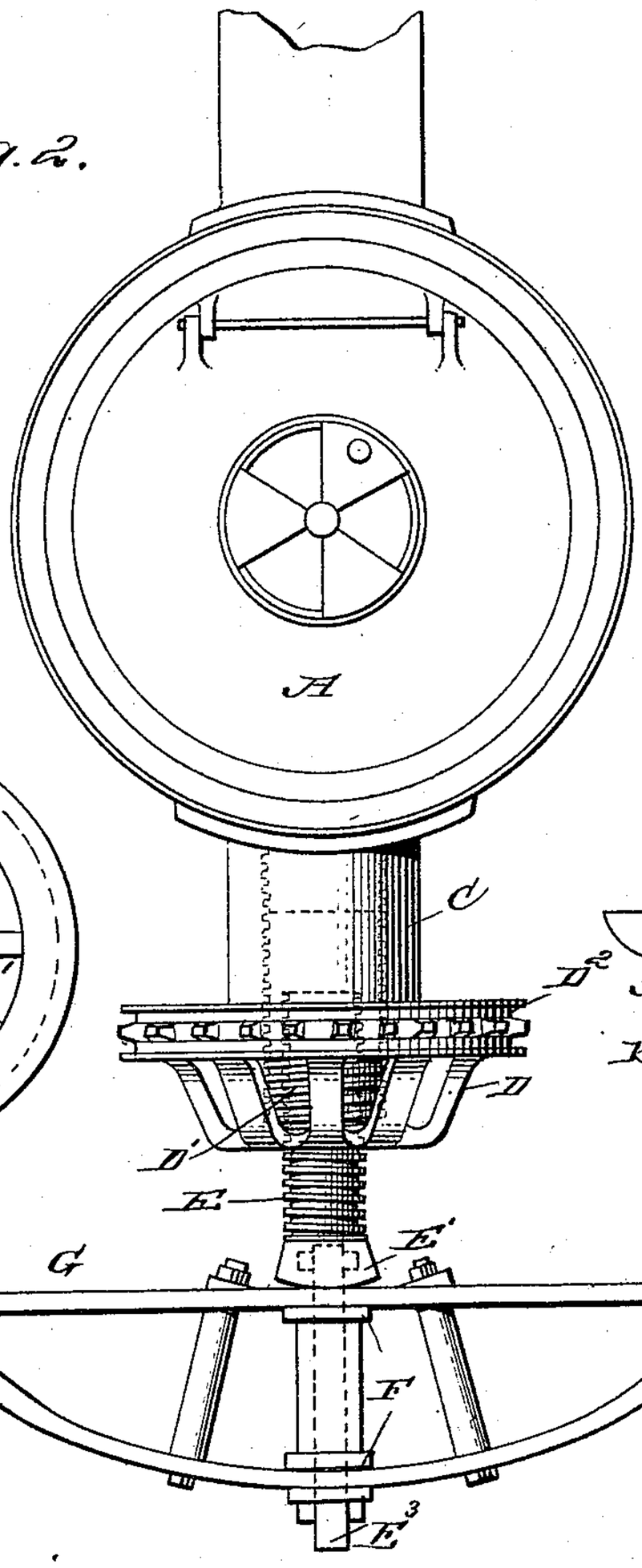

Fig. 3.

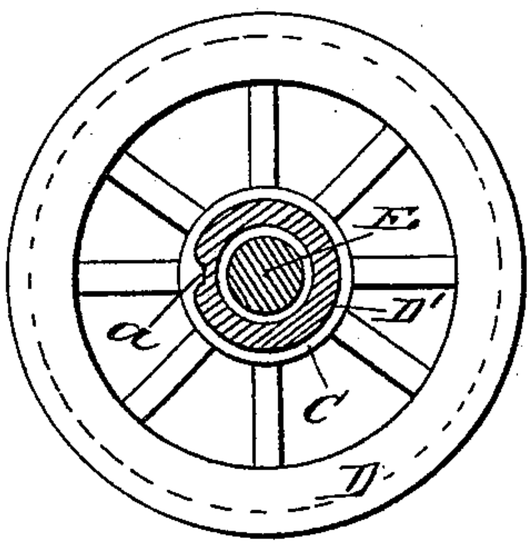

Fig. 5.

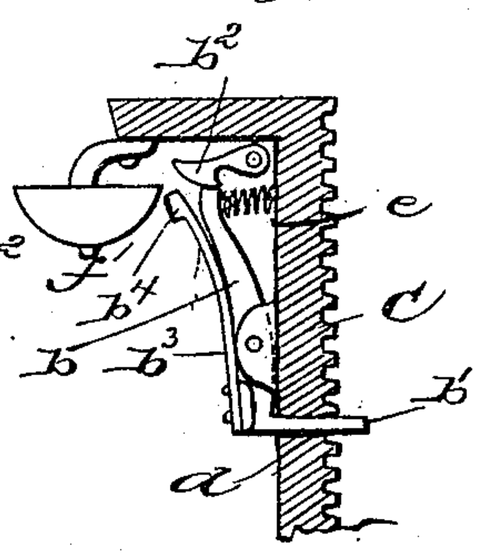

Fig. 4.

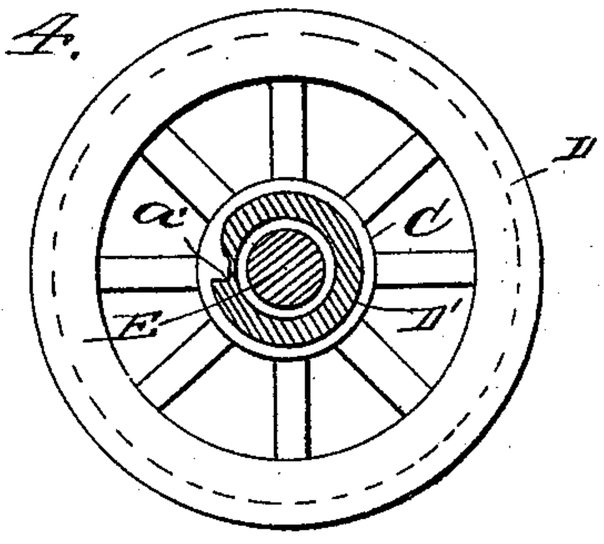

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Fig. 6.

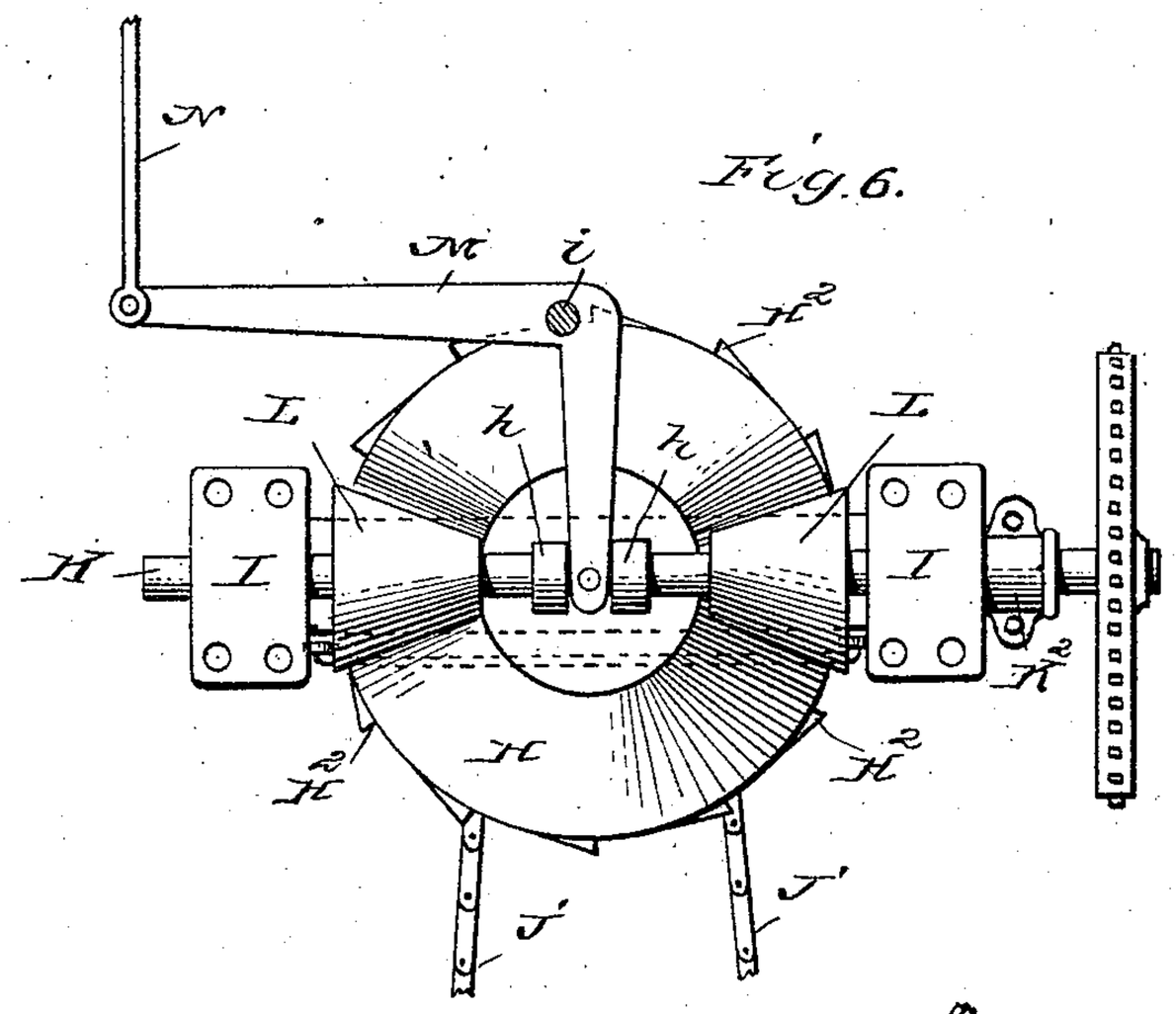


Fig. 7.

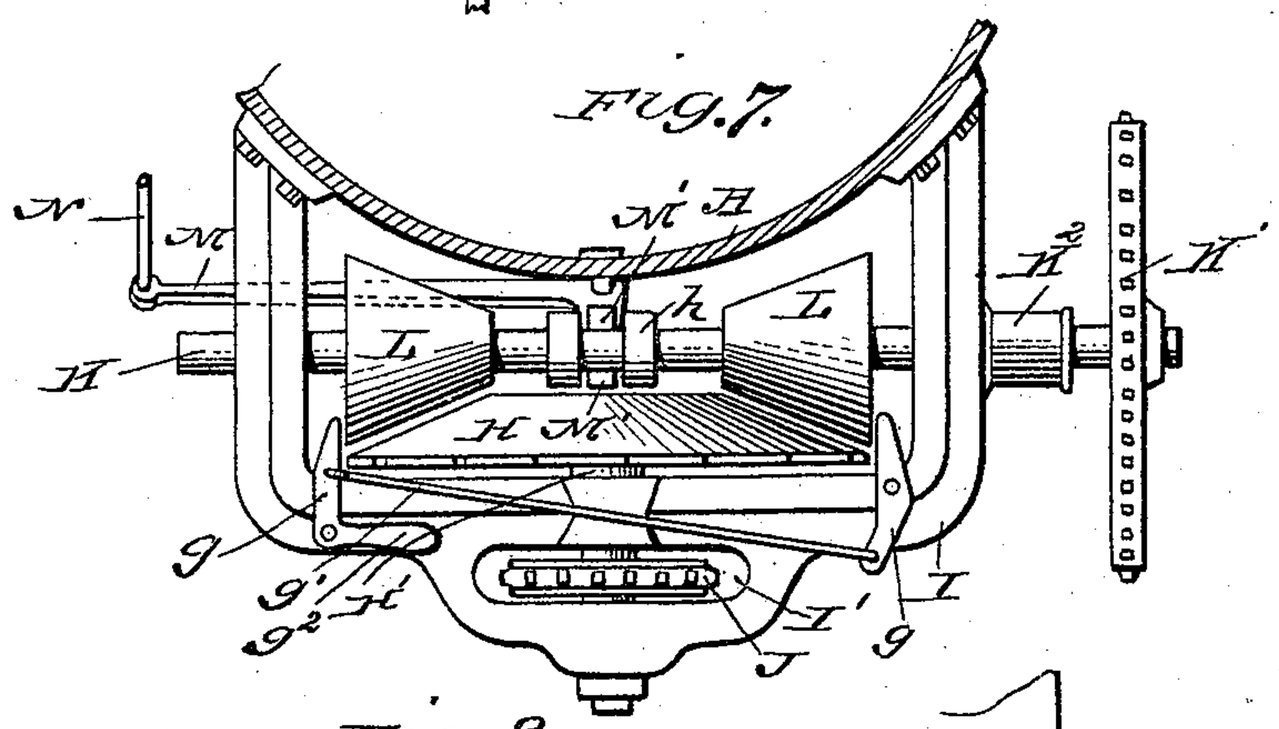
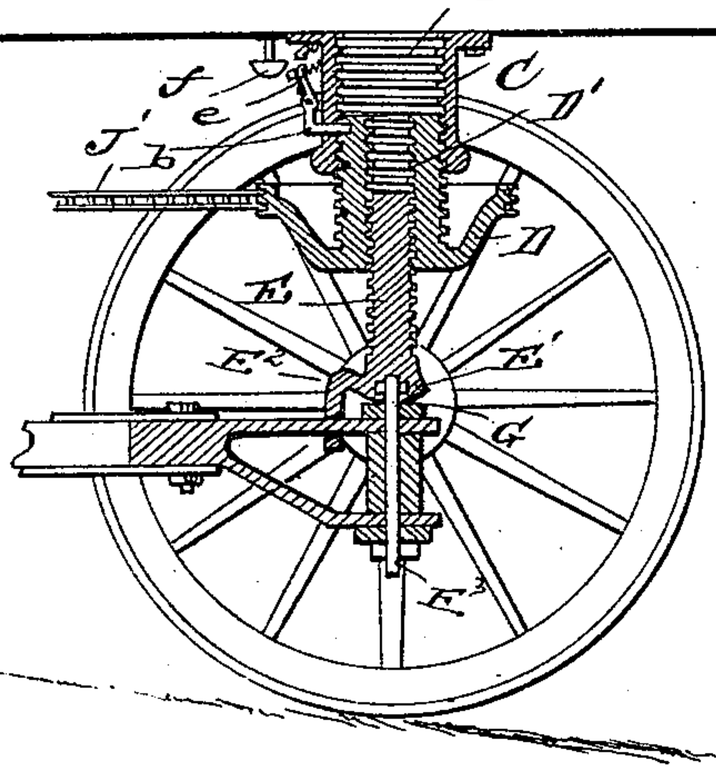


Fig. 8.



WITNESSES:
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UNITED STATES PATENT OFFICE.

FRANK SAXON, OF WORTHINGTON, MINNESOTA.

BOILER-LEVELING DEVICE FOR ROAD-ENGINES.

SPECIFICATION forming part of Letters Patent No. 436,267, dated September 9, 1890.

Application filed May 22, 1890. Serial No. 352,748. (No model.)

To all whom it may concern:

Be it known that I, FRANK SAXON, of Worthington, in the county of Nobles and State of Minnesota, have invented a new and Improved Boiler-Leveling Device, of which the following is a full, clear, and exact description.

My invention relates to improvements in devices for leveling traction boilers and engines. It is well known that in propelling traction boilers and engines over uneven ground the boiler is continually thrown out of level, and as a consequence part of the boiler-flues are exposed to the heat while dry and the boiler damaged, and the general operation of the boiler and engine is seriously interfered with.

The object of my invention is to obviate this difficulty by providing means whereby a boiler may be easily leveled when resting upon very uneven ground or when traveling over the same.

To this end my invention consists in certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a traction boiler and engine provided with the apparatus embodying my invention, the wheels of one side being removed and the leveling device at the forward end of the boiler being shown in section. Fig. 2 is a broken end view of the same, but with the wheels removed from the forward axle. Fig. 3 is a cross-section on the line $x\ x$ of Fig. 1, showing the notch in the sprocket-wheel hub for actuating the bell-pawl. Fig. 4 is a cross-section on the line $y\ y$ of Fig. 1, showing a notch in the sprocket-wheel hub for actuating the bell-pawl and for engaging the same so as to limit the movement of the said hub. Fig. 5 is a broken enlarged detail view of the bell-pawl and its supports. Fig. 6 is a detail plan of the friction-pulley and its connection for driving the forward sprocket-wheel. Fig. 7 is an end view of the same; and Fig. 8 is a vertical section of the forward hoisting mechanism, showing the position of the same when the boiler is in an elevated position.

The boiler A is mounted upon suitable wheels B in the usual manner, and bolted to the forward portion, so as to depend therefrom, is a hollow drum C, having an interior screw-thread C′, as shown, said drum being open at its lower end, and fitting within the drum is the hollow hub D′ of a sprocket-wheel D, said hub being screw-threaded exteriorly to fit the screw-thread of the drum C, and having an interior screw-thread in which fits the vertical support E, which is screw-threaded, as shown.

The sprocket-wheel D is provided with a grooved and toothed portion D^2, and the hub D′ has formed therein, in the bottom of the thread-groove thereof and in vertical alignment, the notches a and a', the central notch a being rounded off at each edge, as shown in Fig. 3, and the other notches, which are arranged upon the upper and lower portion of the hub, have one square edge, as shown in Fig. 4, to engage the bell-pawl, as hereinafter described. It will thus be seen that the sprocket-wheel D will have a double action, as when turned it will screw the hub D′ into the drum C and will also screw the support E into the hub D′, thus quickly changing the position of the boiler A. It will be readily seen that when the sprocket-wheel is turned in one direction the boiler will be raised, and when turned in the opposite direction the boiler will be lowered.

The support E rests at its rounded lower end E′, as shown, upon the flattened portion of the axle G, and is held thereto by the king-bolt E^3, and said support is also provided with a depending arm E^2, which projects downwardly through the frame F, which connects the forward axle with the rear portion of the boiler, said arm serving to hold the support in position on the axle.

The axle G is centrally flattened, as shown, to provide a suitable rest for the lower end of the support E, and said axle is suitably braced, as shown in Fig. 2.

Pivoted upon the rear portion of the drum C is a pawl b, the lower end of which b' is bent at an angle and projects through a perforation d in the drum C, said end b' fitting in the thread of the hub D′ of the sprocket-

wheel. A flat spring b^3 is fixed to the back portion of the pawl b, and its upper end is formed into a hammer b^4 to strike the gong f. It will thus be seen that as the sprocket-wheel D is turned, when the boiler reaches a level position the end b' of the pawl b will drop into the notch a, thus throwing out the upper end of the pawl and sounding the gong; but as the edges of the notch a are rounded the notch will not hold the pawl in engagement, and when the drum D′ is turned the end of the pawl will be disengaged from the notch.

The notches a' are placed near the upper and lower portions of the hub D′, and are intended to limit the movement of the hub and also to sound the gong. The notches a' have one square edge, as shown, and when the end of the pawl falls into said notches it will engage the square portion thereof and prevent the hub from being turned farther. The upper end of the pawl b is provided with a spiral spring e, which presses outwardly against the pawl, so as to force the lower end inward. When the bell is sounded, the engineer stops the sprocket-wheel D, thus fixing the position of the boiler.

A pivoted latch b^2, located adjacent to the upper end of the pawl b, is adapted to engage the hammer b^4, and when the pawl is out of engagement with the perforations in the hub D′ the latch will hold the hammer from the gong, but when the pawl drops into said perforations the hammer will be released and will strike the gong, the spring e being strong enough to force the pawl back.

A beveled friction wheel or pulley H is mounted upon the vertical shaft H′ in the depending bracket I, which is fixed to the lower side of the boiler A, in alignment with the drum C and sprocket-wheel D. The pulley H is fixed to the shaft with its beveled portion uppermost, and the shaft H′ is also provided with a sprocket-wheel J, which is fixed thereto and turns in an opening I′ of the bracket I, and is connected with the sprocket-wheel D by the chain J′, so that when the sprocket-wheel J is turned the motion will be transmitted to the sprocket-wheel D.

A horizontal shaft K is mounted in the bracket I above the friction-pulley H, so as to be longitudinally movable in its bearings, said shaft having fixed to one end a sprocket-wheel K′, to which the power is transmitted by a suitable chain from the engine fly-wheel A′, although a gear mechanism may be substituted for the wheel and chain. The shaft K turns in a box K^2, which is fixed to the bracket I, and which limits the movement of the shaft in one direction, and the shaft is also provided with conical friction-pulleys L, which limit the movement of the shaft, and which are adapted to engage the beveled surfaces of the friction-pulley H.

The pulleys L are arranged upon the shaft K, so as to bear against the opposite sides of the beveled face of the friction-wheel H, so that when one of the cone-pulleys is brought into engagement with the friction-pulley H it will turn in one direction, and when the other cone-pulley is brought in engagement therewith it will be turned in the opposite direction.

Pivoted upon opposite sides of the bracket I are the dogs g, which are connected by a rod g', which extends from the upper part of one to the lower part of the other, so that they may be moved simultaneously against or away from the pulley or disk H. One of the dogs is provided with a weight g^2, which tends to hold the dogs in engagement with the projections of the pulley H, and thus prevent the said pulley, the sprocket-wheel J, the chain J′, and the sprocket-wheel D from turning. When one of the pulleys L is brought into engagement with the pulley H, the dogs g will be crowded out of the way.

Centrally fixed upon the shaft K are two similar collars h, a short distance apart, and between which fit the bifurcated ends M′ of the bell-crank lever M. The lever M is pivoted at the elbow by a bolt i to the boiler A in the rear of the shaft K, and the outer end of the lever is connected by a rod N with a lever O, which is pivoted upon the outer side of the boiler, where it may be easily reached by the engineer, whose position is at the rear of the boiler.

Fixed to the boiler adjacent to the lever O is a rack P, having a central notch therein, and the lever O is provided with the usual spring-actuated rod r to engage the notch of the rack and hold the lever in position. The notch in the rack P is arranged centrally therein, so as to hold the cone-pulleys L from engagement with the friction-pulley H, and by moving the lever forward one of the said cone-pulleys may be made to engage the friction-pulley H, and by moving the lever backward the other cone-pulley may be made to engage the friction-pulley. It will thus be seen that the device is easily operated.

By moving the lever O one of the pulleys L is brought into engagement with the pulley H, thereby turning the same, and the motion is transmitted by means of the sprocket-wheel J and chain J′ to the sprocket-wheel D, which will turn the hub D′ and raise or lower the boiler, as described.

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

1. A boiler-leveling device consisting, essentially, of an internally-screw-threaded drum fixed to the lower front portion of the boiler, a sprocket-wheel having a hollow hub internally and externally screw-threaded, the external screw-thread fitting the thread of the drum, a support mounted upon the forward axle and screw-threaded so as to fit the inner screw-thread of the sprocket-wheel hub, and means for turning the sprocket-wheel, substantially as described.

2. A boiler-leveling device for traction boil-

ers and engines, consisting, essentially, of a hollow internally-screw-threaded drum fixed to the lower front portion of the boiler, a sprocket-wheel having a hollow screw-threaded hub fitting the screw-thread of the drum, the inner portion of the hub being screw-threaded, a vertical support mounted upon the forward axle and having a screw-thread fitting the inner screw-thread of the sprocket-wheel hub, a friction-disk mounted in a suitable support and driven by a belt and friction from the engine, and a sprocket-wheel fixed to the friction-disk shaft and connected by a chain with the sprocket-wheel at the forward end of the boiler, substantially as described.

3. In a leveling device for traction boilers and engines, the combination, with an internally-screw-threaded drum fixed to the lower forward portion of the boiler, a sprocket-wheel having a hollow hub externally and internally screw-threaded and adapted to fit in the drum, and a vertical support resting upon the forward axle and screw-threaded to fit the inner thread of the sprocket-wheel hub, of a vertical shaft mounted in a suitable bracket in the rear of said sprocket-wheel and provided with a friction-disk and sprocket-wheel, the sprocket-wheel connecting by a suitable chain with the forward sprocket-wheel, a horizontal shaft mounted in the bracket above the friction-disk and provided with friction cone-pulleys, a bell-crank lever pivoted to the boiler in the rear of said shaft and having one arm connecting therewith, a lever pivoted upon the outer side of the boiler having its lower end connecting with the outer end of the bell-crank by a suitable rod, and a rack and rod for fixing the position of the lever and the friction-pulleys connected therewith, substantially as described.

4. In a boiler-leveling device, the combination, with the internally-screw-threaded drum C, having the perforation *d* therein, as shown, and the sprocket-wheel D, having a screw-threaded hub D′, adapted to turn in the drum C, said hub having notches *a* and *a′* therein, of the spring-actuated pawl *b*, having one end projecting through the perforation *d* of the drum to engage the notches of the hub D′, and the gong *f*, arranged adjacent to the pawl *b*, so as to be struck by the hammer b^4 on the upper end of the same, substantially as described.

5. A boiler-leveling device for traction boilers and engines consisting, essentially, of a hollow internally-screw-threaded drum C, a sprocket-wheel D, having a hollow hub D′, internally and externally screw-threaded and adapted to fit in the thread of the drum C, the vertical supports E, having a screw-thread fitting the inner screw-thread of the hub D′, and having a depending arm E^2 to engage the frame F, as shown, the depending bracket I, attached to the boiler in the rear of the drum C, the horizontal friction-pulley H, fixed to a vertical shaft mounted in the said bracket, said shaft being provided with a sprocket-wheel connecting by a chain with the sprocket-wheel D, the horizontal shaft K, adapted to slide in its bearings and provided with collars *h* and with friction cone-pulleys L to engage the pulley H, the bell-crank lever M, pivoted to the boiler-bottom and connecting with the shaft K, and the rod N of the lever O for actuating the bell-crank, substantially as described.

6. The combination, with the friction-pulley H, having projections H^2 thereon, of the dogs *g*, pivoted to the bracket I and connected together, as shown, said dogs being adapted to engage the projections of the friction-pulley, substantially as described.

FRANK SAXON.

Witnesses:
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JOHN SAHLBORN.