

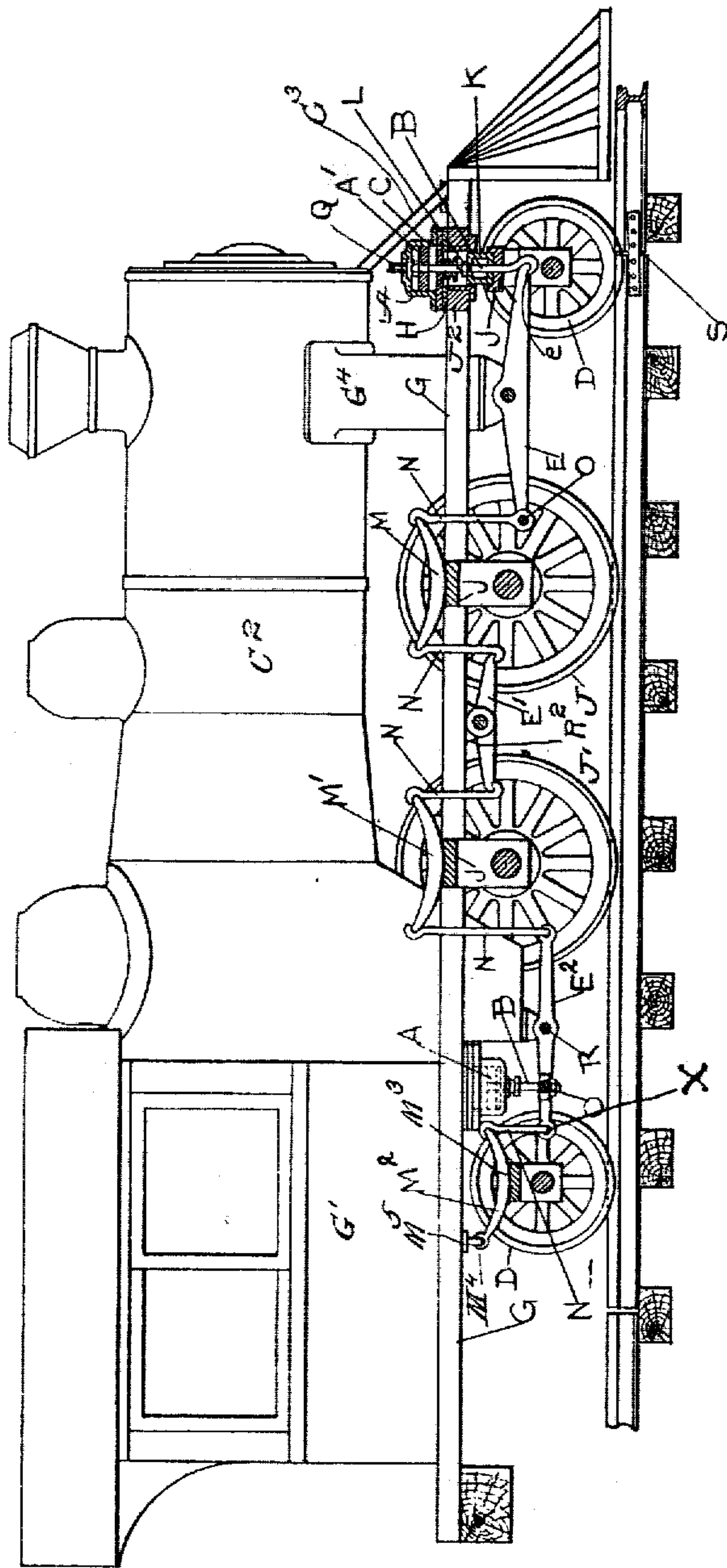
No. 816,505.

PATENTED MAR. 27, 1906.

F. L. SHELDON.
TRACTION INCREASING MECHANISM.
APPLICATION FILED AUG. 11, 1905.

2 SHEETS—SHEET 1.

Fig. 1



WITNESSES:

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E. C. Vrooman.

INVENTOR

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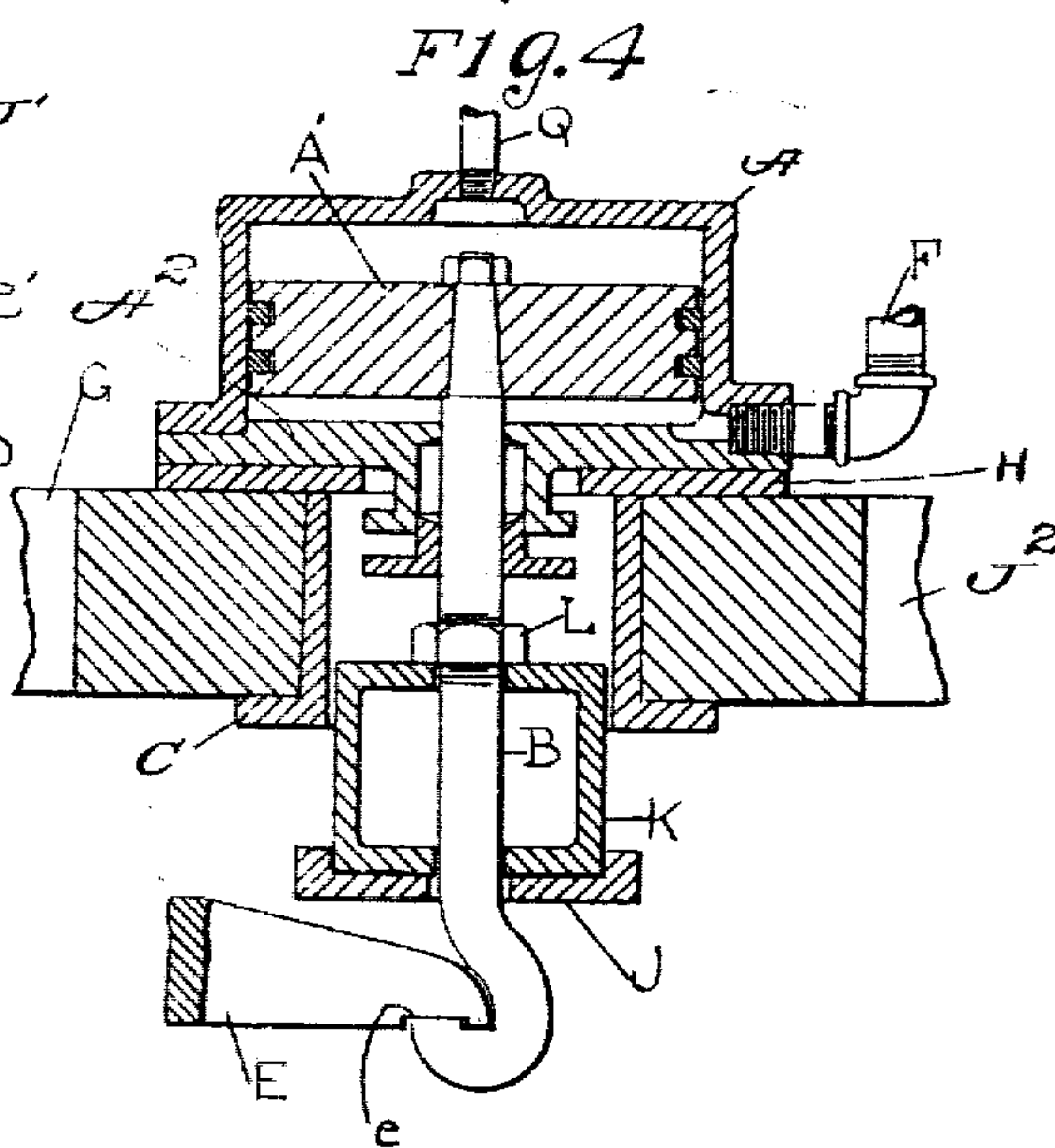
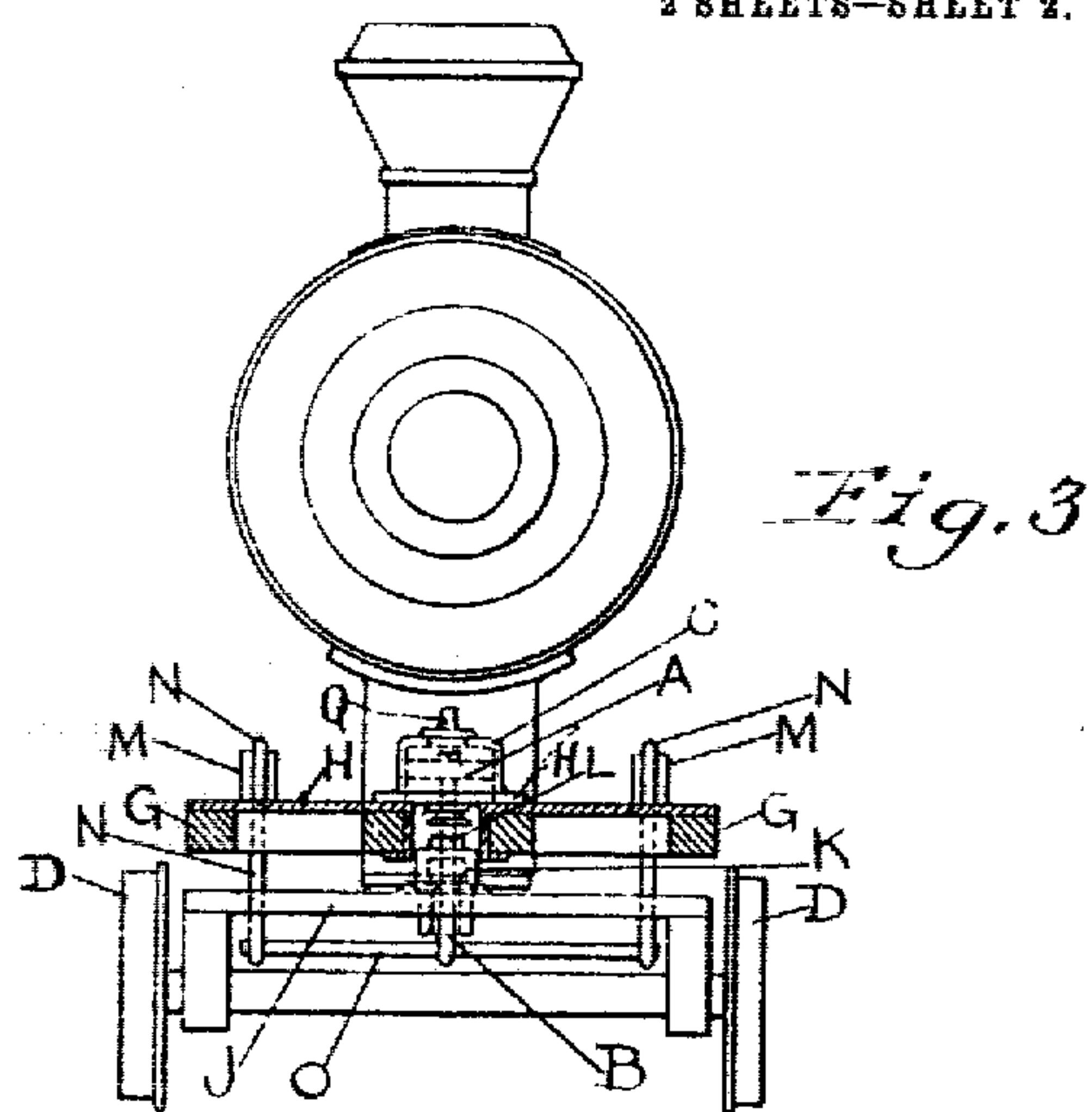
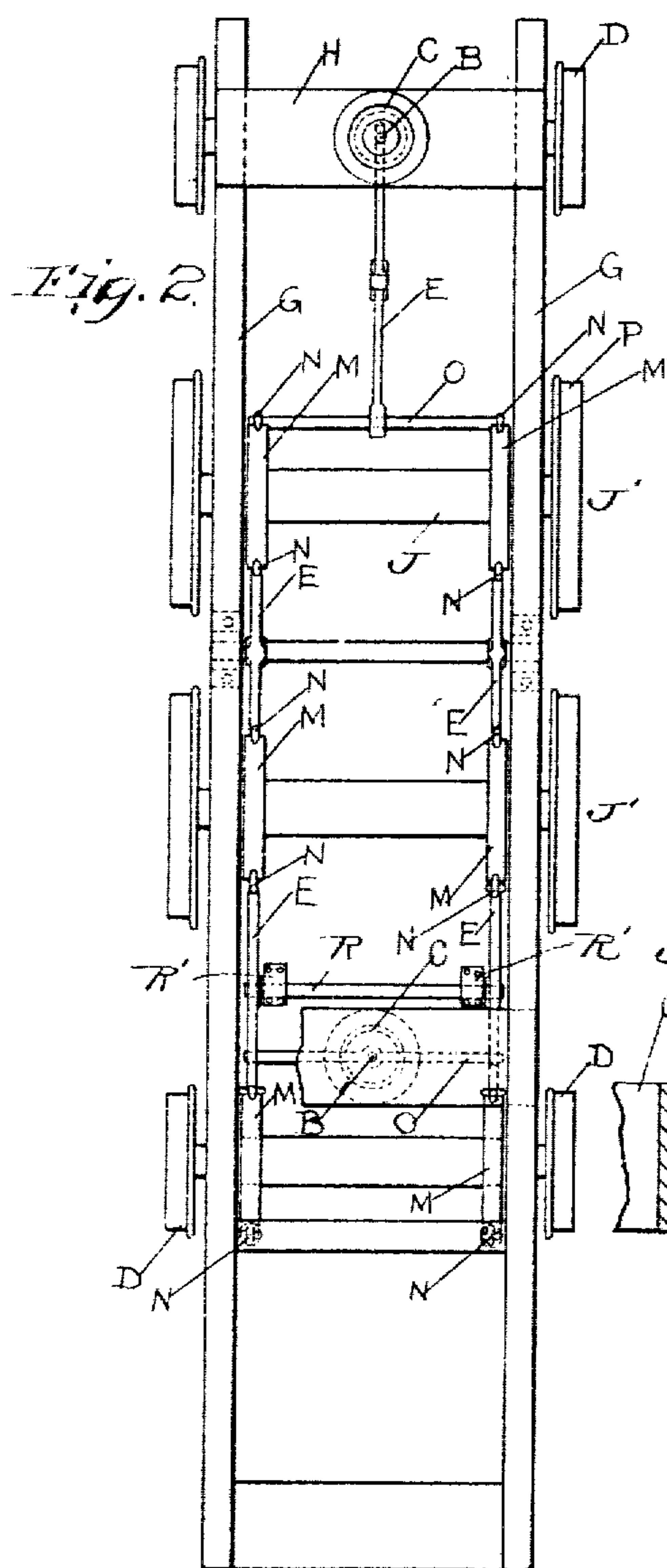
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UNITED STATES PATENT OFFICE.

FRED L. SHELDON, OF TACOMA, WASHINGTON.

TRACTION-INCREASING MECHANISM.

No. 816,505.

Specification of Letters Patent.

Patented March 27, 1906.

Application filed August 11, 1905. Serial No. 273,802.

To all whom it may concern:

Be it known that I, FRED L. SHELDON, a citizen of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Traction-Increasing Mechanism; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in means for taking approximately all of the weight of an engine off the pony-trucks and placing it upon the drive-wheels.

One of the several objects of the invention is the provision of means for facilitating the removal of all of the weight possible from off the pony-trucks and placing the same upon the drive-wheels during such time as an engine is climbing a grade or starting a heavy load. Under such circumstances it is very natural for the wheels of an engine to slip, and the additional weight supported by the pony-truck will diminish this tendency. Again, the track upon which an engine is running may be rough by reason of depressions formed therein, or the track may be raised. In other instances the rails may be and are in many cases so arranged that one end of a rail is raised a little above the adjoining end of the other rail. An engine running at a slow speed under such circumstances or attempting to pull a heavy load striking such a place is thrown off its balance, and the weight-balances change. This starts slipping of the drivers, and it requires considerable time for an engine to adjust itself to perform the work for which it was intended.

Therefore another object is the provision of means for facilitating the raising of the weight from off the pony-trucks at intervals and placing it upon the drive-wheels—that is to say, when an engine is pulling a heavy load or climbing a grade, and it is then also that an engine needs to be steady, so that it can hug the track closely and so that a jar from front or rear will not throw it from its balance.

A further object of the invention is the provision of means for removing approximately all of the weight which is supported upon the pony-trucks off the same and placing it upon the drive-wheels of an engine in which the boiler is not directly supported upon the

pony-trucks, but is carried by a line of equalizers and radius bars or levers and springs.

With these and other objects in view the invention consists of certain other novel constructions, combinations, and arrangements of parts, as will be hereinafter fully described, illustrated in the accompanying drawings, and more particularly pointed out in the claims hereto appended.

In the drawings, Figure 1 is a view in side elevation of an engine provided with a mechanism constructed in accordance with the present invention, the running-gear of said engine and my improved mechanism being partly shown in section. Fig. 2 is a top plan view of the frame, the pony-trucks, and drive-wheels, as well as my improved mechanism for raising the weight off of the pony-trucks and placing it upon said drive-wheels. Fig. 3 is a front view, in elevation, of the mechanism depicted in Fig. 1, a part of my invention being shown in transverse section. Fig. 4 is a vertical fragmentary sectional view of the mechanism, showing one of the cylinders, a piston mounted therein, and connecting means for securing the same to one of the levers of the mechanism.

Referring to the drawings by letters of reference, G designates a horizontal frame, which carries the cab G and the boiler G². A bracing and supporting member G³ is secured to the front end of the boiler G² and the frame G. Depending from boiler G², near its front end, is a standard G⁴. The frame G is supported upon the horizontal portions or saddles J of the drive-wheel boxes J' J'. Upon the forward end of the frame G is secured a transverse beam J², upon which is mounted a transverse plate H. Brackets R' are secured to a portion of the boiler. Brackets R² are secured to the frame G.

Pivotaly secured to the lower portion of the standard G⁴ is a forward or main lever E. A pair of intermediate levers E' are secured to the brackets R². Rear or auxiliary levers E² are pivotaly secured to the brackets R'. I preferably position parallel springs M and M' upon the saddles J of the drive-wheel trucks J', and these springs M and M' are connected to the levers E' and E² by means of hanger bars or members N. It is to be noted that I preferably employ only one main or primary lever E, which is connected to the forward hanger members N through the medium of the horizontal rod or shaft O. The forward hanger members N are each provided

with an eye at its lower end, in which the rod O is positioned. The upper ends of the forward hanger members N are preferably provided with hooks which engage one end of the springs M. The hanger members N, which connect the intermediate levers E' to the springs M and M', are each preferably provided with hooked ends, which engage one end of the spring and the opposite end engages a notched or cut-out portion e, Fig. 4, which prevents the hangers from becoming disassembled with the levers. The hanger members N, which connect the auxiliary levers E² to the springs M' are each preferably provided with a hook which engages eyes X, formed upon the ends of the auxiliary levers E². The hangers which connect the primary lever E and the auxiliary levers E² with the springs are of greater length than the intermediate levers connecting said springs with the intermediate lever E'. The springs M², which engage the saddle M³ of the rear pony-truck or trailer, are each provided with an eye M⁴, which is secured to the frame beneath the cab G' by any suitable means—as, for instance, the plate M⁵. The front end of each of the springs M² is connected to the rear end of the levers E² by a comparatively short hanger member in the same manner as the forward ends of said levers E² are connected to the springs M'.

By forcing the rear end of the auxiliary levers E² and the forward end of the primary lever E upward nearly all of the weight which is supported upon the front and rear pony-trucks D will be lifted off of the same and placed upon the drive-wheels. While different means may be employed for swinging the primary and auxiliary levers for placing approximately all of the weight on the drive-wheels, I have preferably illustrated steam-actuated means for accomplishing this result.

The steam-actuated means for swinging the levers comprises, preferably, cylinders A, carried upon the frame by any suitable means one being preferably secured near the front of the frame in a manner hereinafter specified and the other secured to the frame contiguous to the cab and rear end of the boiler. As each of these cylinders and their coacting parts are of substantially the same structure, it will be unnecessary to specifically describe more than one, although a slight difference is involved in constructing the rear cylinder A and its coacting parts, which will be mentioned hereinafter. Referring particularly to the front-lever-actuating means, it comprises a cylinder A, within which is slidably mounted a piston A', which is provided with suitable packing secured upon its outer edge. The cylinder A is placed upon a base-plate A², which rests upon the metallic flat, transverse plate H, supported by the transverse beam J² of the frame G. A sleeve C is positioned within the aperture formed in the beam J². The plate

H is provided with an aperture registering with the sleeve C. A removable king-bolt B, constituting a piston-rod, is secured to the piston A. This piston-rod B is provided with a hook formed upon its lower end which engages the recessed or cut-out portion e formed upon the front end of the primary lever E. The saddle J of the front pony-truck is provided with a cut-out or socket portion, within which is seated a hollow box or sleeve K, constituting a support. The piston-rod B is threaded intermediate its length and carries a nut L, which is adapted to bear upon the box K when the weight, which is resting upon the pony-truck, is not lifted off the same. The base-plate A² is provided with a gland for preventing of steam escaping from the cylinder A around the piston-rod B. Steam may be discharged into the cylinder A through the inlet-pipe F for moving the piston A' upward and lifting the forward end of the primary lever E, through the medium of the piston-rod B. An air duct or port is formed upon the upper portion of the casing of the cylinder A, in which is positioned an escape-pipe Q. If it is desired, a suitable exhaust may be formed upon the cylinder A, or, in the present instance, the pipe F preferably constitutes not only the inlet but also the outlet. In the construction of the rear cylinder A, the piston-rod B extends through that portion in the case of the forward cylinder which is provided with the air-duct. In other words, the positions of the cylinders are reversed. The piston B of the rear cylinder is connected to a horizontal bar or rod O. The rod O is secured to the auxiliary levers E² intermediate the rod R and the rear ends. Steam is supplied to the rear cylinder A in the same manner as it is supplied to the front cylinder. The steam is preferably supplied synchronously to all of the cylinders for actuating the primary and auxiliary levers at the same time for shifting the weight simultaneously off of the pony-trucks onto the drive-wheels.

The tracks upon which an engine is running are sometimes rough, because the connection of the rails are in many cases so arranged that one end of a rail is raised a little above the adjoining end of another rail, as depicted at S, Fig. 1, and in such an instance if an engine is running at a slow speed or attempting to pull a heavy load and strike such a place it is under ordinary conditions thrown off its balance and the weight changes, also on a wet or slippery rail and in starting heavy trains or in running slow around heavy curves, where elevation of the track throws the engine out of proper balance and any other condition that causes engines to slip. This undesirable shifting of the weight-balance is overcome by my invention, for it is possible to hug the track closely, so that a jar from the front or rear will not throw it

from its balance. The more weight that can be thrown upon the drivers the less said engine is apt to slip.

It is to be noted that this invention is not intended to raise the engine or boiler, but merely the weight that rests upon the pony-trucks, which in the type of engine depicted in Fig. 1 comprises two in number. Each of these pony-trucks comprises an axle, a pair of wheels, boxing, and a saddle. The driving-trucks are also preferably constructed similarly to the pony-trucks. The rear pony-truck is commonly designated as the "trailer."

While I have specifically described in the foregoing description steam-actuated means for manipulating the levers and hangers, this specific means is not absolutely necessary for accomplishing the result for which they are employed, as other means may be used for swinging the primary and auxiliary levers.

What I claim is--

1. The combination with drive-wheel trucks, front and rear pony-trucks, a frame supported upon said drive-wheel trucks, a boiler carried by said frame, of a depending standard secured near the front end of said boiler, a main lever pivotally mounted upon said standard, an auxiliary lever pivotally mounted upon said boiler or frame, an intermediate lever pivotally mounted upon said frame, parallel springs mounted upon said drive-wheel trucks and rear pony-truck, means connecting said levers to said springs, and means for swinging the outer end of said primary and auxiliary levers upward and thereby lifting weight off of said pony-trucks.

2. In a mechanism of the class described, the combination with drive-wheel trucks, and front and rear pony-trucks, a frame carried by said drive-wheel trucks, of a boiler carried by said frame, said boiler provided with a depending standard formed near its front end, a primary lever pivotally mounted upon said standard, auxiliary levers pivotally mounted upon said boiler or frame near its rear end, intermediate levers pivotally mounted upon said frame between said drive-wheel trucks, parallel springs positioned upon said drive-wheel trucks and the rear pony-truck, means connecting the springs carried by the rear pony-truck to the frame, hangers connecting said levers to said springs, cylinders carried by said frame near the front and rear ends, pistons mounted within said cylinders, means connecting said pistons to the outer ends of said levers, said pistons being capable of moving within said cylinders for swinging said levers and thereby removing weight off of said pony-trucks and placing it upon the drive-wheel trucks.

3. In a mechanism of the class described, the combination with a drive-wheel truck, a front and a rear pony-truck, a frame supported upon said drive-wheel truck, a boiler

carried by said frame, of a primary and auxiliary levers pivotally mounted upon said boiler or frame, means engaging said drive-wheel truck and connecting the levers, a cylinder carried by said frame above said front pony-truck, a piston positioned within said cylinders, said front pony-truck provided with a saddle, a piston-rod extending through said saddle and secured to said piston, a member carried by said piston-rod and normally bearing against said saddle for supporting the weight carried by said pony-truck, and means for synchronously swinging the rear ends of the auxiliary levers upward when said piston is moved within the cylinder for lifting the front end of the primary lever upward.

4. In a mechanism of the class described, the combination with a drive-wheel truck, front and rear pony-trucks, a frame positioned above the axles of said trucks, a boiler positioned above said frame, of a saddle having a recess carried by said front pony-truck, springs carried by said trucks, levers and hangers connecting said springs, a piston-rod extending through the saddle of the front pony-truck and connected to one of said levers, said piston-rod provided with a supporting member, an adjustable member carried by said piston-rod and normally in engagement with said supporting member, said member normally resting in the recess of the saddle, a cylinder provided with a piston positioned above said front pony-truck, said piston connected to said piston-rod, a cylinder positioned near the rear pony-truck, a piston positioned within said last-mentioned cylinder, and a piston-rod connected to said piston and the levers contiguous to said rear pony-truck.

5. In a mechanism of the class described, the combination with drive-wheel trucks, front and rear pony-trucks, a frame positioned above the axles of said trucks, a boiler positioned above said frame, of a standard secured to said boiler near its front end, springs positioned upon said trucks, means connecting the springs carried by said rear pony-truck at one end to said frame, intermediate levers fulcrumed upon said frame between said drive-wheel trucks, a primary lever fulcrumed upon said standard, auxiliary levers fulcrumed upon said boiler or frame between the rear pony-truck and one of said drive-wheel trucks, a cylinder secured to said frame contiguous to said rear pony-truck, a piston provided with a piston-rod, positioned within said cylinder, said piston-rod connected to said auxiliary levers, said front pony-truck provided with a saddle, said frame provided with a transverse beam above said saddle, a flat, metallic plate secured upon said beam, said plate and beam provided with registering apertures, a sleeve positioned within the aperture of said beam, a cylinder

positioned above said plate, a base-plate interposed between said flat plate and cylinder, said cylinder provided with inlets and outlets, a piston positioned within said cylinder, a piston-rod provided with a threaded portion intermediate its ends, and with a hooked lower end, said piston-rod connected to said piston, said primary lever provided with a recess, the hooked lower end of said piston-rod connected to said primary lever and engaging its recessed portion, a hollow box positioned upon said piston-rod and normally engaging the recessed portion of said saddle, and an adjustable member threaded upon said rod and normally bearing upon said hollow box.

6. The combination with front and rear pony-trucks, a drive-wheel truck between said front and rear pony-trucks, a frame supported upon said drive-wheel truck, a boiler positioned above said frame, of movable members supported upon said frame and in engagement with said drive-wheel and rear pony-truck, means carried by said frame and connected to said movable member contiguous to said rear pony-truck for moving the member, a cylinder provided with a piston, carried by said frame contiguous to said front pony-truck, a piston-rod provided with a hook, connected to said piston, said piston-rod connected to said movable members, and means carried by said piston-rod and engaging said front pony-truck for normally supporting the weight upon said pony-truck.

7. In a mechanism of the class described, the combination with a pony-truck, of a saddle carried by said pony-truck, a frame positioned above said saddle, a cylinder carried by said frame, a piston positioned within said cylinder, a piston-rod connected to said piston and extending through said saddle, a lever in engagement with said piston-rod and adapted to press upon said saddle and capable of being moved, when said piston-rod is actuated for moving said lever, and thereby lifting weight off of said saddle.

8. A mechanism of the class described, the combination with a pony-truck provided with a saddle, a piston-rod extending through said saddle, a lever connected to said piston-rod, a member, constituting a stop, positioned upon said piston-rod, a box interposed between said stop and saddle, and capable of being engaged by said stop for supporting weight, and means for moving said piston-rod and lever and thereby lifting weight off of said saddle.

9. A lever-actuating device for a traction-

increasing mechanism, comprising a saddle, a frame carried contiguous to said saddle, a cylinder carried by said frame, a piston positioned within said cylinder, a piston-rod slidably mounted upon said saddle and fixedly secured to said piston, an adjustable member threaded upon said piston-rod, a box positioned upon said piston-rod between said saddle and adjustable member, and a lever supported upon the outer end of said piston-rod.

10. In a mechanism of the class described, the combination of a pony-truck provided with a saddle, a frame positioned above said saddle, a vertically-movable member connecting said saddle and frame, means connected to said movable member and normally pressing down upon said saddle for supporting weight, and means for moving said member for lifting weight off of said saddle.

11. In a mechanism of the class described, the combination with a pony-truck and a frame, of a slidable rod connecting said pony-truck and frame, a member, constituting a stop, carried by said rod, a stationary member positioned upon said rod between said stop and pony-truck, the stop normally pressing upon said stationary member and pony-truck, and means for moving said rod and thereby lifting weight off of said pony-truck.

12. In a mechanism of the class described, the combination with drive-wheel trucks, front and rear pony-trucks, a frame positioned upon the axle of said front truck, a boiler positioned above said frame, of a standard secured to said boiler near one end, springs positioned upon said trucks, means connecting one end of one of the springs to said frame, an intermediate lever fulcrumed upon said frame, between said drive-wheel trucks, a primary lever fulcrumed upon said standard, an auxiliary lever fulcrumed upon said boiler and frame between the rear pony-truck and one of said drive-wheel trucks, means connecting all of said levers and springs, a cylinder provided with a piston carried by said frame contiguous to said front pony-truck, and a piston-rod connected to said piston, said piston-rod extending through a portion of said front pony-truck and connected at its lower end to said primary lever.

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

FRED L. SHELDON.

Witnesses:

EMIL U. STENBERG,
R. H. LUND.