(No Model.) 2 Sheets—Sheet 1.

H. K. ADAMS.

LOCOMOTIVE.

No. 353,395. Patented Nov. 30, 1886.

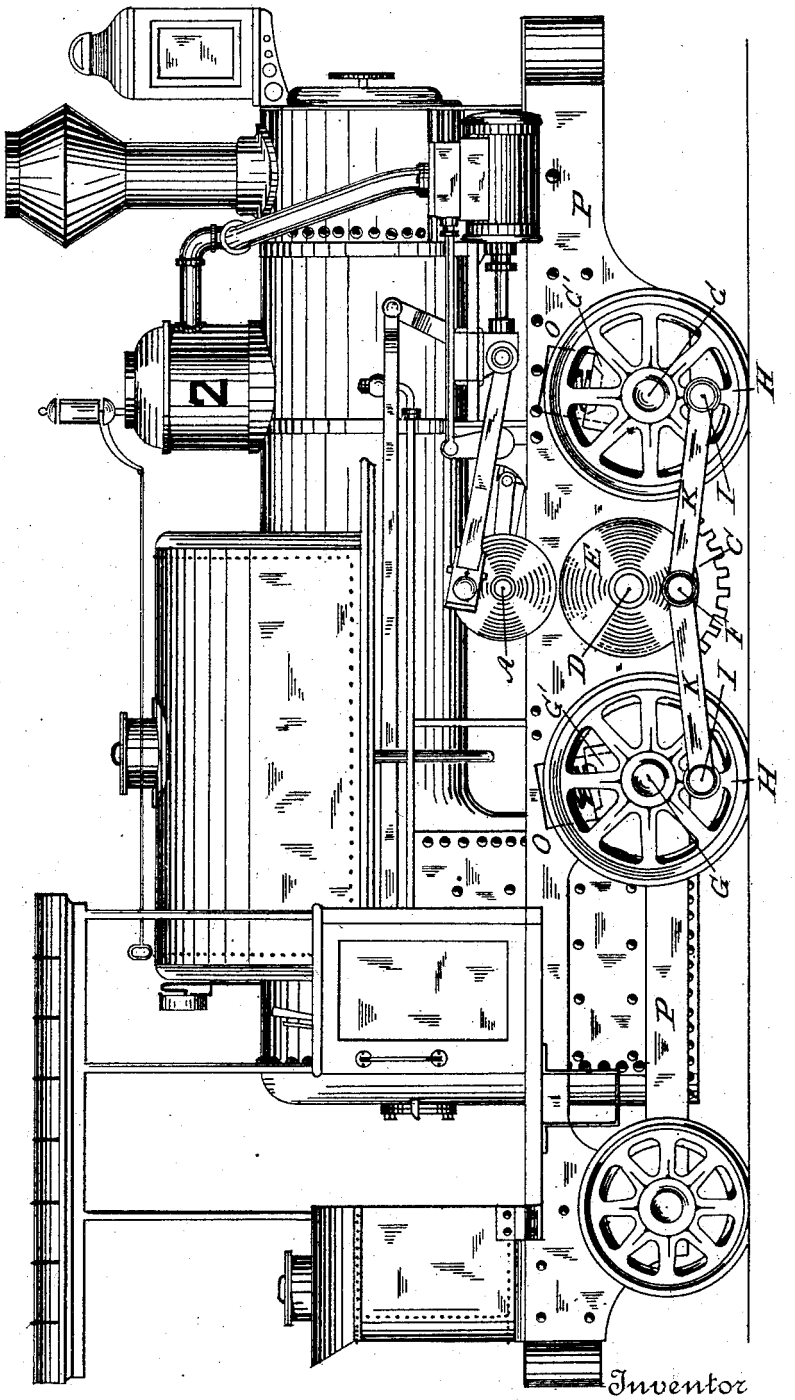

Fig. 1.

Witnesses
Wm. E. Huntemann.
Edwin L. Jewell.

Inventor
Henry K. Adams
By his Attorneys
Whittemore & Wright

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

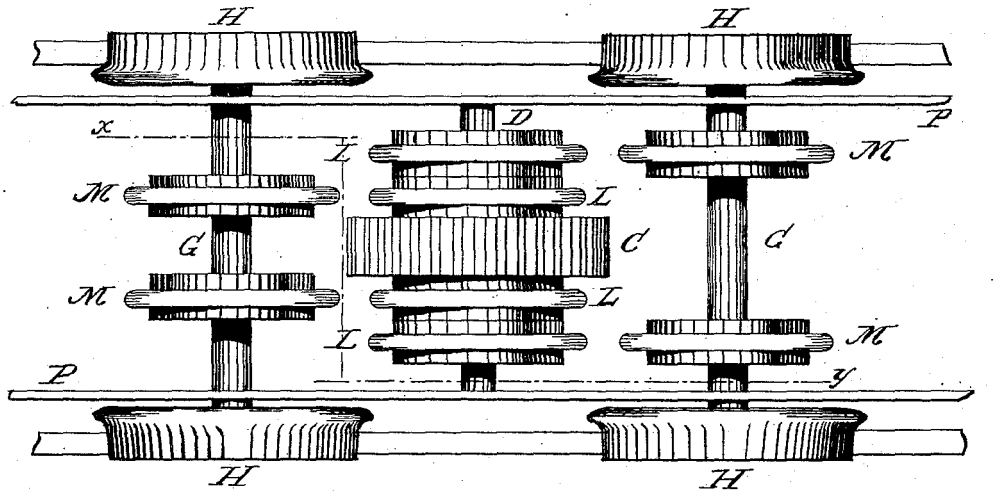
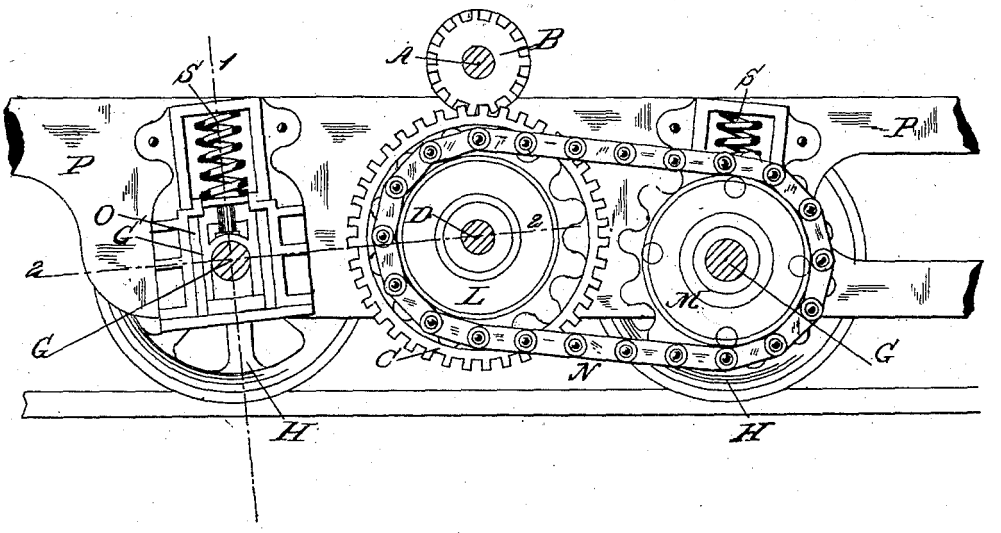


Fig. 3.



Witnesses:
Wm. F. Huntemann.
Edwin L. Yewell.

Inventor
Henry K. Adams
By his Attorneys
Whittemore & Wright.

UNITED STATES PATENT OFFICE.

HENRY K. ADAMS, OF NASHVILLE, TENNESSEE.

LOCOMOTIVE.

SPECIFICATION forming part of Letters Patent No. 353,395, dated November 30, 1886.

Application filed April 16, 1886. Serial No. 199,075. (No model.)

To all whom it may concern:

Be it known that I, HENRY K. ADAMS, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented certain new and useful Improvements in Locomotives; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to locomotives, and more especially to that class of locomotives which is used for light traffic, as on pole-roads in lumbering regions, on tramways in cities or in suburban towns, on contractors' temporary railway-tracks, and other similar roads. Instead of acting directly on the driving-wheels, as in most locomotives, these engines are usually provided with a separate engine-shaft, on which is a pinion meshing with a spur-gear on an intermediate or master shaft, which is in turn geared to the driving-axles.

In order to carry the spur-gear clear of any obstructions on the track, the master-shaft must be placed considerably above the plane of the driving-wheel axles, and heretofore it has been customary to use chains and sprocket-wheels to communicate power from the master-shaft to the driving-wheels. In the case of pole-road locomotives, I find that the exacting service to which they are subjected results in very rapid wear of the chains; and as their renewal is expensive, I have done away with them entirely and substituted connecting-rods, as hereinafter described. Furthermore, when the master-shaft is set above the plane of the driving-wheel axles, and the pedestals which receive the axle-boxes are vertical, or at right angles to the plane of the axles, the shifting of the axle-boxes up and down in the pedestals tends to constantly alter the distance between the master-shaft and the axles, and results in straining and breaking the chains or the rods connecting the master-shaft with the drivers. To obviate this difficulty, I set the pedestals at such an angle that a line passing through the center of the master-shaft and the center of the axle when its box is at about the center of the pedestal will be perpendicular to the line of up-and-down movement of the axle-box in the pedestal. In other words, the play of the axles is compelled to be tangential to a circle struck from the center of the master-shaft and touching the center line of the pedestals. By this arrangement I reduce to a minimum the lengthening of the chains or rods, and so lessen the danger of breaking them.

In the accompanying drawings, Figure 1 is a side elevation of a pole-locomotive equipped with my rod-connection. Fig. 2 is a plan view of the forward part of the frame, showing the master-shaft, spur-gear, sprocket-wheels, &c. Fig. 3 is a sectional elevation on line *x y*, Fig. 2, showing the inclined pedestals.

Similar letters refer to similar parts in all the views.

A is the engine-shaft, carrying a pinion, B, which meshes with a spur-gear, C, on the master-shaft D. This spur-gear is so large that the master-shaft D is located above the plane of the axles G G, in order to raise the gear above stumps, stones, or other obstructions on the line. On each end of the master-shaft is a crank-disk, E, its wrist-pin being lettered F. On the main or driving axles G G are mounted the driving-wheels H H, each of which is provided with a crank-pin, I. The driving-wheels may have the usual tread and flange, as shown, or they may have double flanges to better adapt them for use on pole-roads.

The distance from the center of the axles G G to the center of their wrist-pins I I is the same as that from the center of the master-shaft D to the center of its wrist-pin F, so that all the wrist-pins describe equal circles.

Rods K K, of the usual construction, connect the wrist-pin F with the pins I I. Although these rods stand at an angle with each other, yet they operate perfectly, and communicate motion to the driving-wheels quite as well as though the master-shaft were in line with the axles G G. When chains are used instead of rods, the master-shaft D is provided with four sprocket-wheels, L L L L, and on each axle G are two such sprocket-wheels, M M. A drive-chain, N, passes from each sprocket L to its corresponding sprocket, M.

O O are the pedestals which receive the axle-

boxes G′ G′. Seated between the axle-boxes and the frame P are strong spiral springs S S.

When the pedestals are perpendicular, as they usually are—that is, set with their center line at right angles to the plane of the driving-wheel axles—the movement of the boxes up and down in the pedestals, owing to irregularities in the road or other causes, continually changes the distance from the centers of the axles to the center of the master-shaft. This tends to break the rods or the chains which communicate power from the master-shaft to the drivers, and in order to reduce the possibility of this to a minimum I incline the pedestals O O, as shown in Fig. 3, so that their center line, 1 1, is at right angles to the line 2 2, passing through the centers of shaft D and axle G, when the axle-box G′ is at or about the center of the pedestal. As the line of movement of the axles is thus made tangential to a circle having its center at D and a radius equal to D G, as the parts are shown in Fig. 3, it follows that the play of the axle G along the line 1 1 on either side of the line 2 2 will only very slightly alter the distance between D and G, not more than in practice will be taken up by the lost motion in the joints of the machinery.

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

1. In a locomotive, the combination, with two driving-axles provided with wheels and crank-pins, of a master-shaft receiving motion from the engines and located above the plane of the driving-wheel axles, a crank-disk on said master-shaft, and rods connecting said crank-disk with the crank-pins on both the driving-wheels, substantially as and for the purpose set forth.

2. In a locomotive, the combination, with a master-shaft receiving motion from the engines and located above the plane of the main axles, of one or more main axles provided with driving-wheels, and means for communicating motion from the master-shaft to the main axles, said axles being mounted in pedestals which are inclined to the plane of the main axles, substantially as and for the purpose set forth.

3. In a locomotive, the combination, with a master-shaft receiving motion from the engines and located above the plane of the main axles, of one or more main axles provided with driving-wheels, and means for communicating motion from the master-shaft to the main axles, said axles being mounted in pedestals which are inclined to the plane of the main axles, so that their center line is tangential to a circle struck from the center of the master-shaft and touching said center line, substantially as and for the purpose set forth.

4. In a locomotive, the combination, with the engine-shaft A, provided with the pinion B, of the master-shaft D, spur-gear C, crank-disk E, wrist-pin F, driving-wheels H H, crank-pins I I, connecting-rods K K, and pedestals O O, which are inclined so that their center line, 1 1, is at right angles to the line 2 2, substantially as and for the purpose set forth.

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

HENRY K. ADAMS.

Witnesses:
JAS. S. PILCHER,
THO. S. WEAVER.