

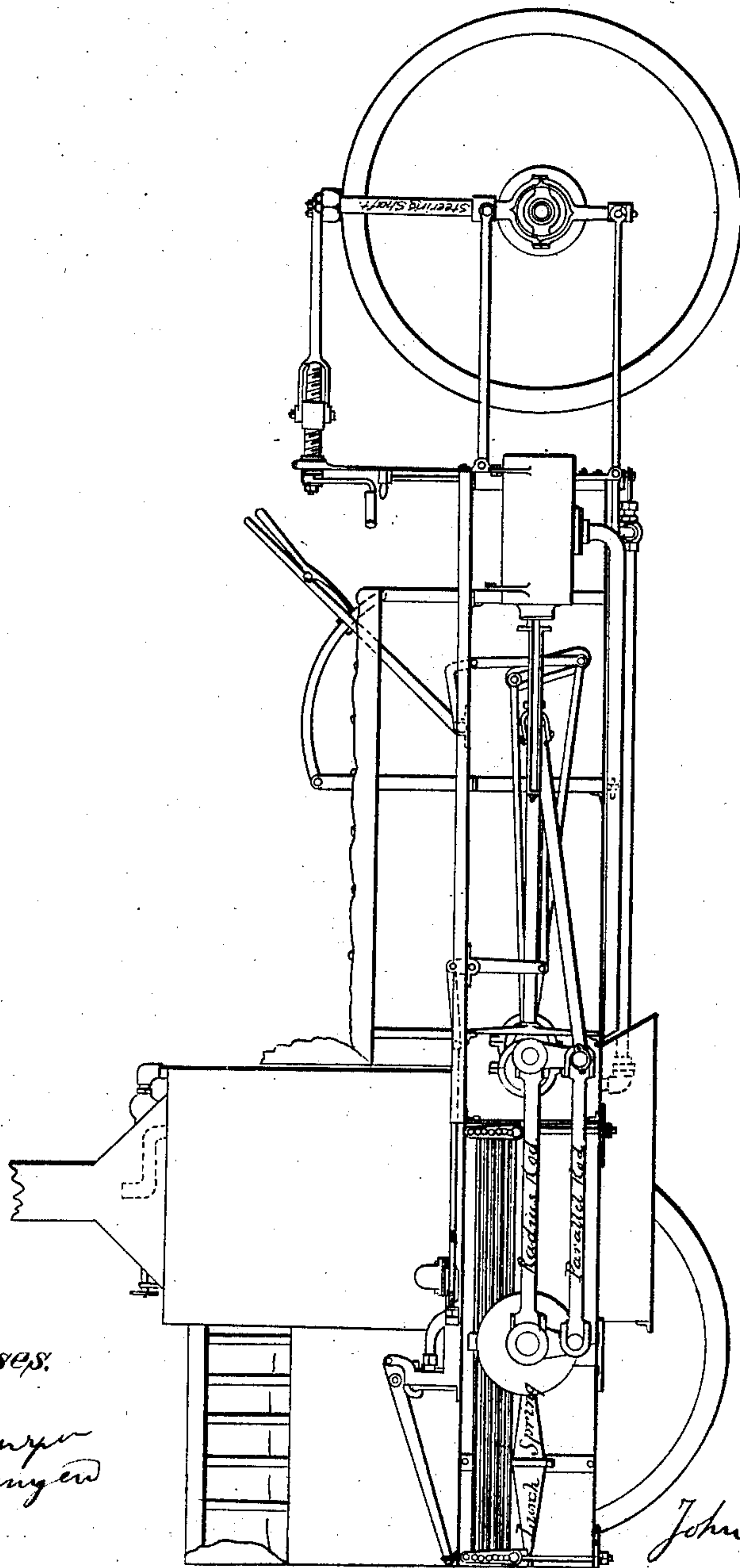
No. 32,991.

PATENTED AUG. 6, 1861.

J. K. FISHER.

LOCOMOTIVE AND STEAM CARRIAGE FOR COMMON ROADS.

2 SHEETS—SHEET 1.



Witnesses:

Thomas J. Sawyer
Fred A. Sawyer

Inventor

John Kenrick Fisher

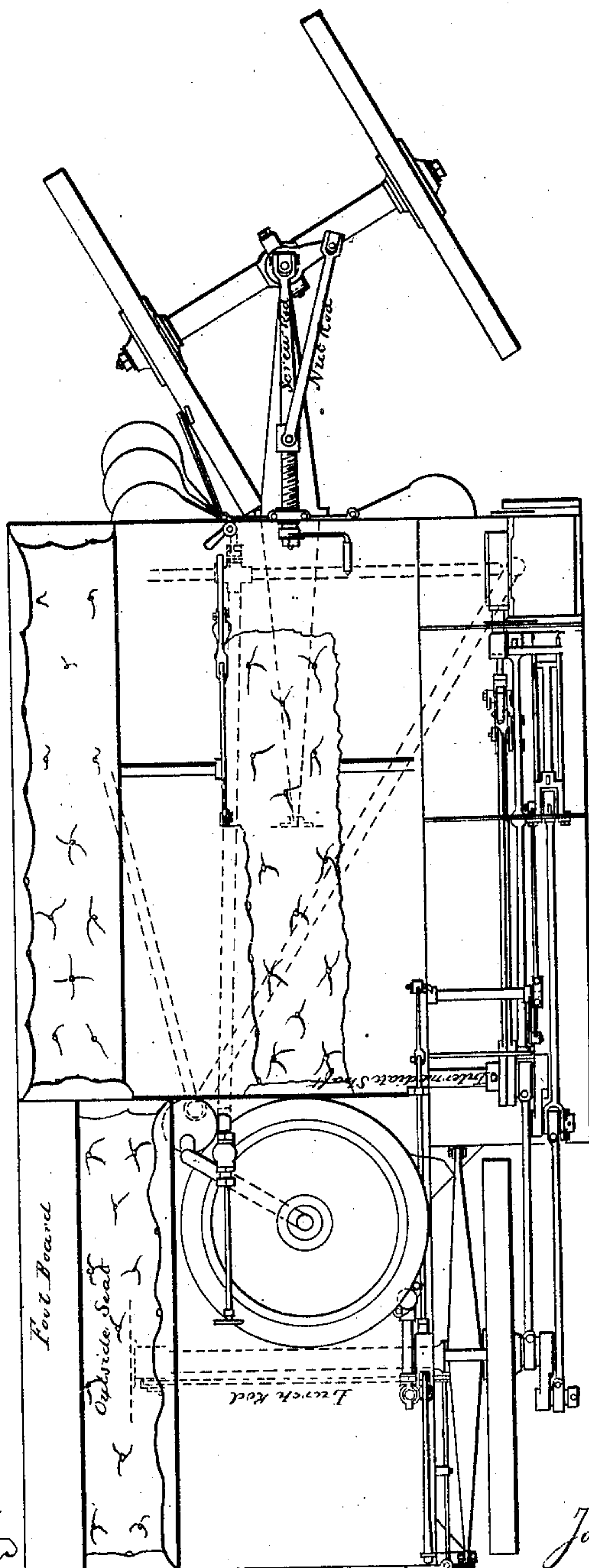
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UNITED STATES PATENT OFFICE.

JOHN KENRICK FISHER, OF NEW YORK, N. Y.

IMPROVEMENT IN LOCOMOTIVES AND STEAM-CARRIAGES FOR COMMON ROADS.

Specification forming part of Letters Patent No. 32,991, dated August 6, 1861.

To all whom it may concern:

Be it known that I, JOHN KENRICK FISHER, of New York, in the county of New York and State of New York, have invented a new and Improved Mode of Constructing and Arranging Certain Parts of Locomotives and Steam-Carriages for Common Roads; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 of said drawings is an elevation, and Fig. 2 a plan, of a steam-carriage according to my improvements.

The nature of my invention consists in a new combination of parts, (previously used,) the effect of which is to enable a locomotive or self-propelling carriage to run steadily with springs sufficiently flexible for common roads, and to be steered securely.

To enable others skilled in the art to make and use my invention, I describe its construction and operation as follows:

I arrange the cylinders, connecting-rods, and valve-gear as usual in locomotives.

In place of the front driving-axle I put an intermediate shaft C, turning in fixed bearings and having outside cranks E E. I use the parallel rods B, as in locomotives, the whole power being transmitted by them to one pair of driving-wheels.

Instead of pedestals in the frame to hold the axle-boxes, I use radius-rods A, one end jointed to the axle and the other to the intermediate shaft C. The joints of the radius and parallel rods are partly spherical to allow the motions incident to uneven roads.

To limit the lateral motion and to prevent concussion, I use a transverse radius-rod (which I call the "lurch-rod") M, one end of which is jointed to an axle-box and the other end to a spring N on the opposite side, (which I call the "lurch-spring.") and which allows about an inch swing toward either side.

I make the frame or body of plate and angle-iron, as in some locomotives, and use the locomotive-boiler for heavy traction-engines and the upright tubular boiler for carriages, and I use any of the approved means of feeding and regulating the steam.

I connect the front axle to the body by two springs F F, placed one over the other as far apart as convenient in the center line of the

carriage, the rear half of these springs being inside and the front half projecting outside the carriage, and the front ends are jointed to a vertical shaft G, in which, between the spring ends, is a ring or slot through which the axle passes. The axle has trunnions which work in holes in the ring, as in Hook's universal joint. I prefer to make the axle hollow and to put within it a revolving axle, upon which one wheel is fixed and the other works tightly, and I intend to use a transverse spring or rigid bar instead of the hollow axle when cheapness is required.

I steer by a screw I, turned by a hand-crank. The screw is hollow and turns upon a rod K, (which I call the "screw-rod,") which takes hold of a stud on the top of the vertical shaft. Upon the screw is a nut I', having trunnions, to which is jointed a forked rod J, (called the "nut-rod,") which takes hold of the pin of a crank L on top of the upright shaft. As the screw turns, the nut moves forward or backward, moving the crank, and with it the shaft and axle. The screw at its hind end turns in a box with a joint partly spherical, the box being connected to the frame.

The utility of these parts and arrangements consists in the following effects:

First. The combination of the radius and parallel rods with the intermediate shaft and driving-axle, with their cranks or equivalents, transmits the power to the driving-wheels without bending the springs and without straining the rods or crank-pins.

Second. The lurch-rod and lurch-spring allow a limited end-play to the axle, yet prevent concussion and absorb the momentum of the suspended mass when it is moving laterally in consequence of inequalities in the road. I admit that the locomotives of Crampton and Sinclair, which have intermediate shafts, run without suffering any flexure of their springs by the oblique action of their connecting-rods; but as their axle-boxes are held in pedestals in the usual way they will not allow the end-play and lurching incident to carriages with very flexible springs running on uneven roads, unless their joints be too loose for durability, and the friction of axle-boxes in pedestals, when their vertical movement is great and the roads are dusty, would be much more than the friction in the joints of the radius-rods.

Third. The connection of the front axle by projecting springs allows the center of gravity to be low, (thus contributing to steadiness,) while the wheels are high, and it increases the distance between the axles, thus giving to the front wheels a leverage sufficient to slip the drivers when turning. Former steam-carriages clutched their wheels to the axle and unclutched one wheel when turning, and slipped the front wheels laterally if they kept both drivers clutched; but I find by sufficient trial that with my arrangement I can turn securely with drivers fast upon the axle, and thus can avoid the expense and trouble of clutches.

Fourth. The screw holds the steering-axle in position, whereas the rack and pinion and other devices were sometimes jerked out of the steersman's hands.

I do not confine myself to the details of construction herein described and shown; but, as cheapness or convenience may require, I intend to put the radius-rods inside or outside the wheels and to place the cylinders outside and level, or inside and vertical or inclined, and I intend to place the screw transversely on a level with the axle and to make it work a reverted pole, which has means of elongation, when I use a locomotive-boiler, and I intend to place the screw under the floor, lengthwise or longitudinally, on a level with the axle, and make it work a rod that takes hold of the axle about a foot from the center; and when I build small carriages, whose frames do not extend backward to afford convenient attachment to the lurch-spring, I intend to use projecting springs, like those in front, but so tapered and connected as to allow a limited side movement. The springs in front are about an inch thick, which is suitable for ninety inches length, to run at high speed. For low speed they may be an inch and a half thick, and shorter springs should be thinner

but as the axle serves as an equalizing-lever their flexibility need not be much more than half that of the hind springs. These springs taper in width from about eight inches in the middle, or sufficient width for the load, toward a point a little beyond the end joints, and the front ends are forked to take hold of boxes on the vertical steering-shaft. The advantage of this shape, as distinguished from a taper in thickness, is that it can be more easily executed and more perfectly tempered.

What I claim as my invention in the plan described is as follows:

1. I do not claim separately the radius rod A, parallel rod B, intermediate shaft C, and driving-axle D, with their cranks E E or crank-pins in the wheels; but I claim the combination of the intermediate shaft C and driving-axle D, with their cranks E E and crank-pins in the wheels, and the radius-rod A and parallel rod B, for the purpose of connecting the engines to the driving-wheels of a locomotive or steam-carriage.

2. The combination of the projecting springs F and vertical shaft G, and the universal joint H for the purpose of connecting the steering-axle to the body of a locomotive or steam-carriage.

3. The combination of the screw I, nut-rod J, screw-rod K, spring K', and crank or arm L, and the vertical shaft G, as described, for the purpose of steering a locomotive or steam-carriage.

4. The lurch-rod M and the lurch-spring N, operating as set forth, for the purpose of limiting and softening the lateral movements of the driving-axle.

December 14, 1860.

JOHN KENRICK FISHER.

Witnesses:

THOMAS J. SAWYER,
FRANKLIN RANSOM.