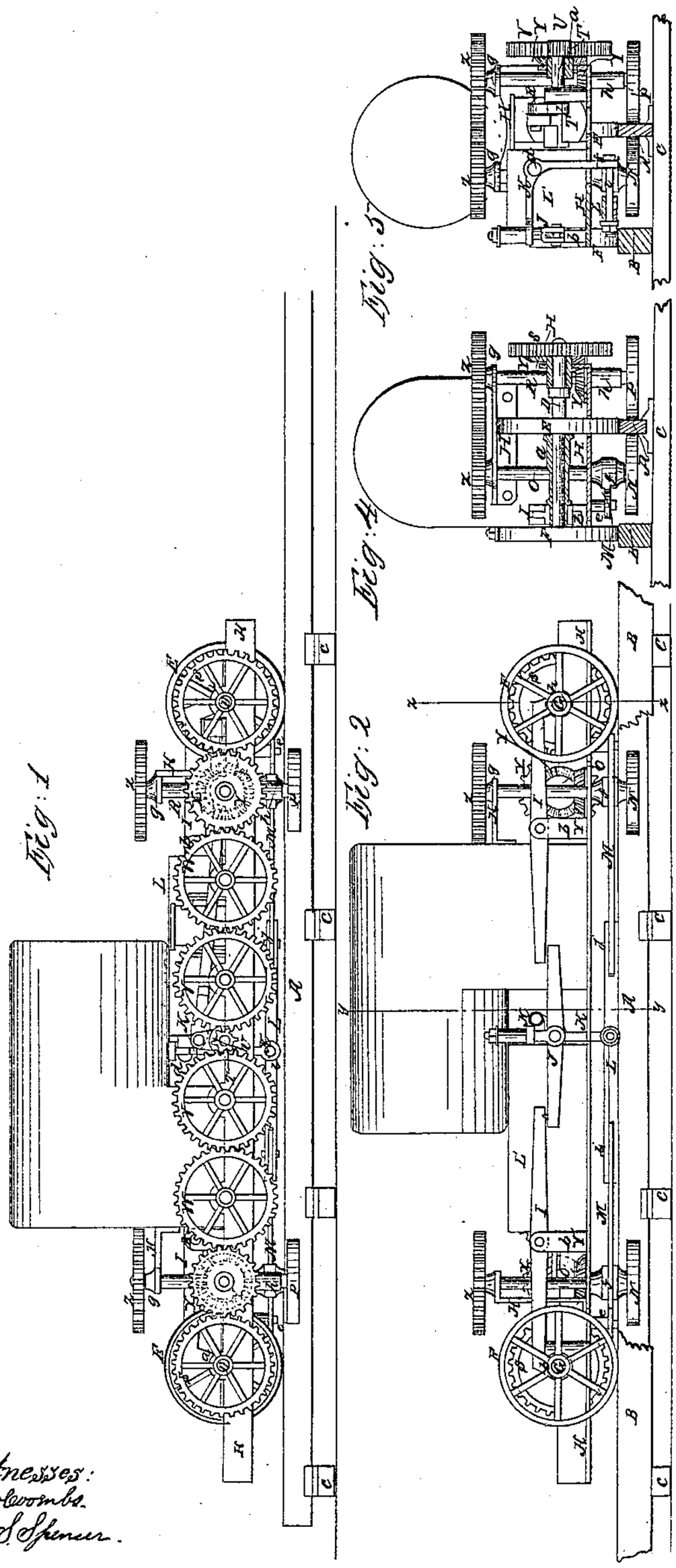
J. L. Whetstone,

Locomotive.

No. 33,760. Patented Nov. 19, 1861.



UNITED STATES PATENT OFFICE.

JOHN L. WHETSTONE, OF CINCINNATI, OHIO.

IMPROVEMENT IN LOCOMOTIVES.

Specification forming part of Letters Patent No. **33,760**, dated November 19, 1861.

To all whom it may concern:

Be it known that I, JOHN L. WHETSTONE, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Locomotives; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figures 1 and 2 are opposite side views of a locomotive and railway-track illustrating my invention. Fig. 3 is an inverted plan of the locomotive. Fig. 4 is a transverse vertical section in the plane indicated by the line *x x* of Fig. 2. Fig. 5 is a transverse vertical section in the plane indicated by the line *y y* of Fig. 2.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists in the employment in a locomotive of wheels applied to bear against opposite sides of a rail, such wheels on one or both sides being the drivers, in combination with supporting-wheels rolling on the top of the same rail, as hereinafter fully described, by which arrangement I obtain a light and cheap locomotive adapted to a cheaply-constructed permanent way, which makes it specially applicable to the purpose of canal towing.

It also consists in the employment of a portion of the weight of the locomotive acting through the intervention of levers or their equivalents to press such driving-wheels toward the side or sides of the rail.

To facilitate the explanation of the construction and operation of my invention, I will first describe the construction of the track upon which the locomotive is to run. This should preferably consist, as represented in Figs. 1, 2, 4, and 5, of two rails A and B supported upon transverse sleepers C C. The principal rail A, upon which the driving-wheels act, may be made of iron or of wood; but I prefer to make it of a flat bar of iron, set up edgewise in suitable chairs. The other rail B, if used, may be of wood, as it is merely to support a small portion of the weight of the locomotive. This rail B might, however, probably be dispensed with, and the wheels which are intended to run upon it would in that case run upon the ground. In case of the track being laid upon the tow-path or bank of a canal the rail A would be very near the brink.

I will now proceed to describe the locomotive.

D D are the supporting-axles, also constituting driving-axles, each fitted with two plain cylindrical-faced wheels E and F, of which E is a driver and firmly secured to the axle itself, and F is merely a supporting-wheel and firmly secured to a sleeve G, fitted to turn upon the axle, E being intended to run on the top of the rail A and F on the top of the rail B. The wheels E E are arranged nearer to the center of the locomotive than those F F to take the greater portion of the weight. The axles D D are extended some distance beyond the outer sides of their respective wheels E E—that is to say, the sides farthest from F F—and at the extremities of the so extended portions they have secured firmly to them the spur-wheels S S.

H H is the framing, one side of which is suspended by suitably-attached boxes *a a* from journals on the axles D D, and the other side of which is suspended, as shown in Fig. 2, by hangers *b b* from two levers I I, one end of each of which is fitted with or rests upon a journal-box *b'*, that is fitted to a journal on one of the two sleeves G G, and the other end of each of which rests upon one end of a beam or lever J, which is suspended at the middle of its length by a spring connection *c* from the horizontal or nearly horizontal upper arm of an elbow-lever K, which is arranged to work transversely to the planes of the wheels E E F F on a fulcrum-pin *d*, which is secured firmly in the side of a tank or fuel-box L', which box, being firmly secured on top of the framing H H, may be considered as a portion thereof. The fulcrum-pin *d* is situated nearly in a vertical plane, passing longitudinally through the center of the locomotive. The vertical or nearly vertical lower arm of the said elbow-lever K is connected by a rod *i* to the middle of a horizontal beam or lever L, whose ends are connected each with one end of one of two horizontally-moving levers M M, which work on fulcrum-pins *e e*, secured to

the bottom of the frame H H, and which carry the lower boxes *f f* of the two upright driving-axles O O. The levers L M M are best shown in Fig 3.

N N and P P are the driving-wheels, operating on opposite sides of the rail A. These wheels are represented as having their faces of cylindrical form; but they may be of other form to suit a rail of different form. The wheels N N are secured to the upright axles O O, before mentioned, and the wheels P P are secured to upright axles R R, arranged opposite to O O. The axles R R are fitted to boxes *g g* and *h h*, that are rigidly secured to the framing H H. The axles O O have their upper journals fitted to boxes *g g* in the framing and their lower ones to the boxes *f f*, before mentioned. That portion of the weight of the locomotive which bears upon the levers I is transmitted partly to the wheels F F and partly to the beam or lever J, and that which is transmitted to the beam J comes upon the elbow-lever K, and by its downward pressure on the upper arm of the lever K causes the lower arm of the said lever to press the beam or lever L toward the center of the locomotive, and so to press the levers M M, the boxes *f f*, and the lower portions of the axles O O in the same direction, and hence to cause the driving-wheels N N to press toward the opposite driving-wheels P P, and so to cause the driving-wheels N N and P P tc press with equal force against opposite sides of the rail A, upon the top of which the supporting-wheels E, which carry the principal portion of the weight of the locomotive, run.

The pressure of the driving-wheels N N and P P against the sides of the rail may be varied by shifting the pins *j j*, which connect the levers L and M M.

The driving-axles D D O O R R may be geared together and driven in various ways. The drawings represent the crank-shaft T of the engine fitted with a small spur-gear U, which is geared by a double train of spur-gears V V W W X X, fitted to studs attached to one side of the framing, with the gears S S on the horizontal driving-axles D D. The spur-gears X X have attached to them bevel-gears Y Y, which gear with bevel-gears Y′ Y′ on the driving-axles R R, and these axles are geared with the driving-axles O O by spur-gears Z Z at the upper ends of said axles.

By the employment of driving-wheels bearing against the sides of a rail, in combination with wheels running upon the top of the same rail, as described, an increased amount of tractive power can be obtained, and at the same time a lighter rail can be used for doing the same amount of work, inasmuch as the wheels, which run upon the top of the rail, if used as drivers, have the adhesion due to the weight resting on them, while at the same time the pressure of the wheels against the sides of the rail can be so adjusted by the levers or other equivalent devices employed to produce such pressure as to cause a much greater degree of adhesion than that due to the mere weight of the locomotive without requiring more stiffness in the rail than is necessary to support the weight of the locomotive.

It may not always be necessary to use the wheels on both sides of the rail as drivers; but they may be used as drivers on one side and as mere rollers on the other side, in which case the gears Z Z, which gear them together, may be dispensed with. In some cases it may be desirable to use only the wheels pressing against the side or sides of the rail A as drivers, and to use the wheels which run on the top of the rail A merely as carriers, without being connected or geared with the engine.

I do not claim, broadly, the use of driving-wheels acting on opposite sides of the same rail, as that is described in the patent granted to G. E. Sellers in the year 1847; but

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

The use in a locomotive of wheels applied to bear against opposite sides of a rail, in combination with wheels running upon top of the same rail, when the side wheels derive suitable pressure from the weight of the locomotive through a system of levers or their substantial equivalents, as is herein fully represented.

JOHN L. WHETSTONE.

Witnesses:

I. F. COLE,

L. C. HOPKINS.