R. Winans,

Locomotive.

No. 19,962. Patented Apr. 13, 1858.

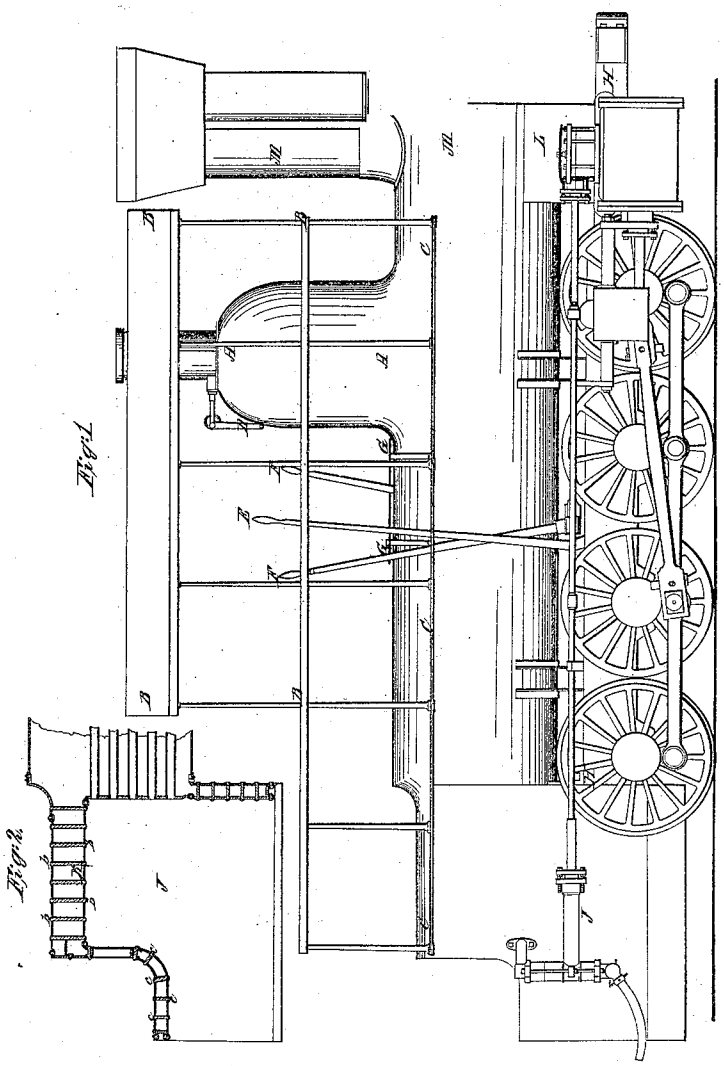

Fig. 1.

Fig. 2.

Fig. 3.

UNITED STATES PATENT OFFICE.

ROSS WINANS, OF BALTIMORE, MARYLAND.

LOCOMOTIVE-ENGINE.

Specification of Letters Patent No. 19,962, dated April 13, 1858.

To all whom it may concern:

Be it known that I, Ross WINANS, of the city of Baltimore, in the State of Maryland, have invented a new and useful Improvement in the Construction of Locomotive-Engines for Railroads, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a side elevation of my improved locomotive. Fig. 2 a vertical longitudinal section of the fire-box, and Fig. 3 a vertical transverse section of the same.

The chief object of my improvement is to adapt the locomotive to the burning of coal as a fuel, without impairing its efficiency in other respects.

It is well known that coal burns much more slowly than wood, and in order to produce an equal quantity of steam in the same length of time, it is necessary to maintain a much larger quantity of coal in combustion; moreover, coal, from the smaller size of its pieces, does not permit the air to pass through a heap of it, as freely as it passes through a heap of burning blocks of wood and the combustion extends only a few inches above the grate, whatever may be the depth of the coal lying thereon; hence, in order to substitute coal for wood, a much larger area of grate surface is required, and this increased grate-surface necessitates the employment of a much larger fire box than is necessary or desirable when wood is used as fuel. In the boilers of stationary engines and in those of vessels, where space can be easily obtained, this increase in the size of the fire-box can be made without difficulty and without alteration of the other parts of the mechanism, but in locomotives, where the space is limited by a variety of circumstances and where the increase of the relative weight of a part of the boiler disturbs the proper distribution of weight upon the wheels, it becomes necessary, before the size of the fire-box can be increased to modify the arrangement and construction of other parts of the locomotive, to prevent the efficiency of the engine, in other respects, from being impaired.

By means of my improvements in the proportions, arrangement, and construction of the fire-box (as the same are described in two other applications for Letters Patent, made simultaneously with this,) the weight of one of sufficient capacity to burn coal with advantage is greatly reduced, but there still remains a preponderance of weight upon the hinder wheels.

The object of the improvement herein claimed is to obviate this difficulty and my invention consists in arranging the position for the engineman, and the fixtures appertaining thereto, for controlling the movements of the engine, between the fire-box and the forward end of the boiler, so that the increased weight of the enlarged fire-box at the hinder end of the locomotive is counterbalanced, in whole or in part, by the removal of the engineman's house and its appurtenances from the hinder end of the locomotive, thereby equalizing the distribution of the weight upon the wheels. It might seem advantageous to move the engineman's house in advance of the smoke-box of the boiler, but, if it were placed in this position, the engineman would have his back to the boiler when looking forward over the track, hence he would be obliged to turn around to attend to his gage-cocks, throttle-valve and pump-valves, and to operate the levers which control the movement of the valve-gear of the engine; or, a complicated arrangement of mechanism would be required to enable him to control these without turning his attention from the track. He would also be separated, by the whole length of the boiler, from the fireman, and the smoke-pipe and steam-dome would obstruct his communication with the fireman by either vocal or visual signals, and would also obstruct his view of the train of cars attached to the engine, and of the track when backing the train. Hence, my invention is limited to the arrangement of the engineman's house at a point between the hinder end of the fire-box and the smoke-box, and this arrangement is productive of many advantages, irrespective of the proper distribution of weight. The engineman, in this position, is of necessity raised higher than he is in the old plan of placing him at the hinder end of the fire-box; and, consequently, he has a better view of the track; he is, also, entirely out of the way of the fireman, who has thus more room for working, while he is sufficiently near the fireman to communicate readily with him; moreover, as he is, by this arrangement, placed nearer those parts

of the engine whose position must be changed by hand in order to reverse or stop its motion, the rods and levers which extend from these parts to the engineman's house, may be made shorter, lighter, and less complex in their arrangement.

My improvement is represented in the accompanying drawings as applied to a locomotive engine having eight connected driving wheels whose axles are all situated in front of the fire-box. The boxes of these axles are sustained by the frame H, which terminates at the forward end of the fire-box J. In this example the hinder pair of wheels overlap the sides of the fire-box, consequently, the width of the latter does not exceed the space between the wheels. It is wider, however, than the space within the frame which terminates, as before mentioned, against its forward end.

The crown-sheet K, of the fire-box is connected by stays *b b*, with the exterior shell, and the latter is depressed, as shown in the drawings, so that barely sufficient space is left for the free circulation of water and the escape of steam. The mode of securing the stays which I prefer is to take a screw thread in the holes through which the stays are inserted and to cut a corresponding screw thread upon the stays. The latter are then screwed into the holes, and they are of such length that, when in place, their ends project the usual distance beyond the faces of the plates for riveting and are riveted up.

The house B B, for engineman, is, in this instance, placed upon the body of the boiler between the fire-box J, and the smoke-box L, and in rear of the smoke-pipe or chimney M, and it covers the steam-dome A, at the hinder quarter of which the engineman generally stands. The floor of the engineman's house is formed by two foot boards C C, which extend from the hinder part of the fire-box to the smoke box, and by a platform G G, which enables the engineman to pass freely from one foot-board to the other and furnishes ample space for tools. The throttle-valve lever D, is situated at the hinder side of the steam-dome, in a convenient position for the engineman, and the reversing lever E, and the starting levers F F, for operating the valves by hand, are also extended into the engineman's house.

I have represented and described my improvement as applied to a locomotive with eight drivers, but it is obvious that the number of wheels may be increased or diminished without affecting my invention. In the example here shown, the fire-box is wider than the inside of the frame, the width being limited only by the hinder pair of wheels which overlap it. If however, these wheels were placed a little farther forward, the width of the fire box could be still further extended and its length correspondingly diminished.

I claim as my invention and desire to secure by Letters Patent.

The arrangement of the house or position for the engineman between the fire-box and the forward end of the boiler, to aid in properly distributing the weight upon the wheels in a locomotive engine with a fire-box of the large size necessary for the economical burning of coal as fuel, and, incidentally, to secure other advantages, substantially as herein set forth.

In testimony whereof, I have hereunto subscribed my name.

ROSS WINANS.

In presence of—
GEO. A. LEPPER,
JOHN J. SNYDER.