3 Sheets—Sheet 1.

R. WINANS.

Car Truck.

No. 4,665.

Patented July 28, 1846.

Fig. 1.

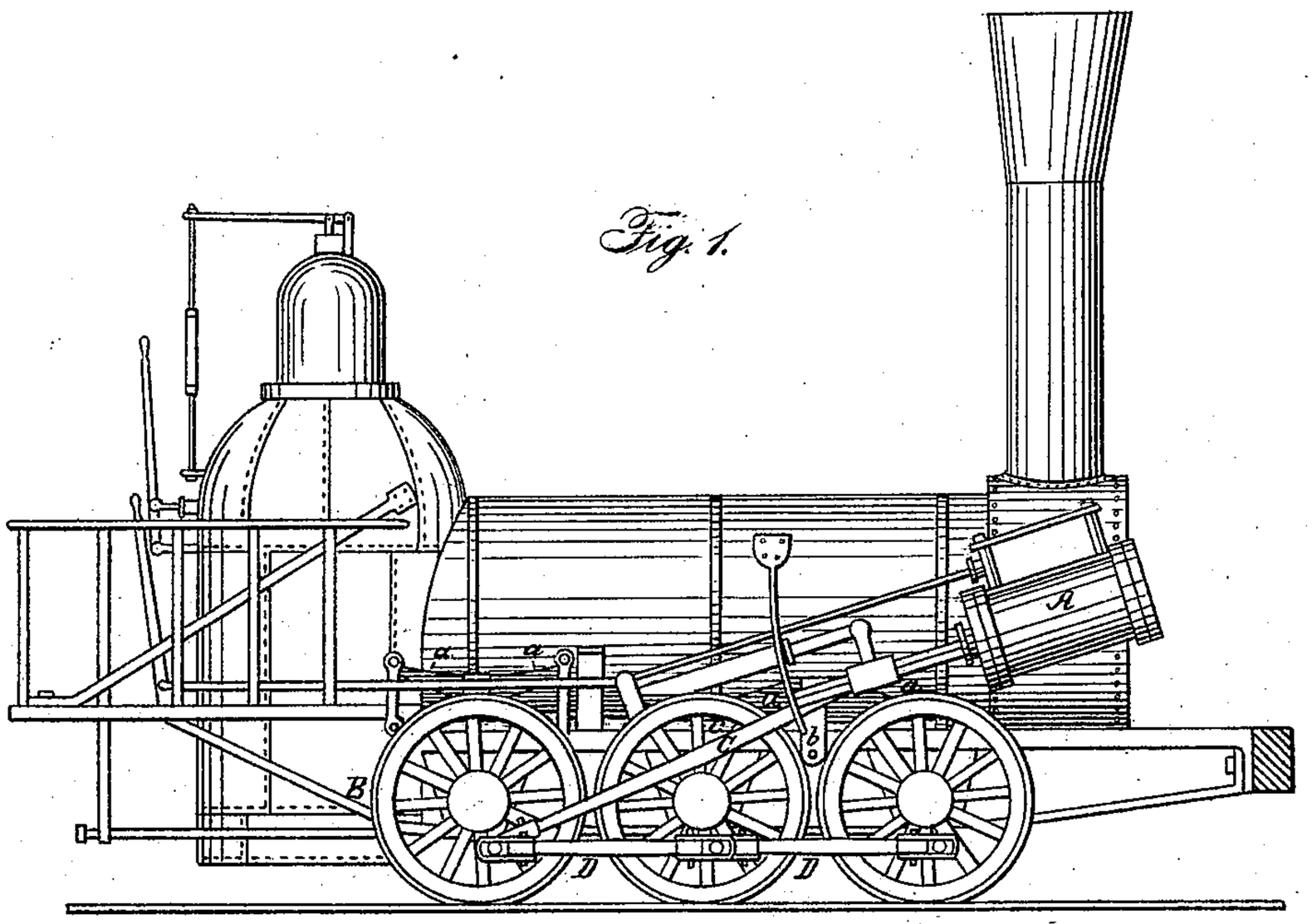
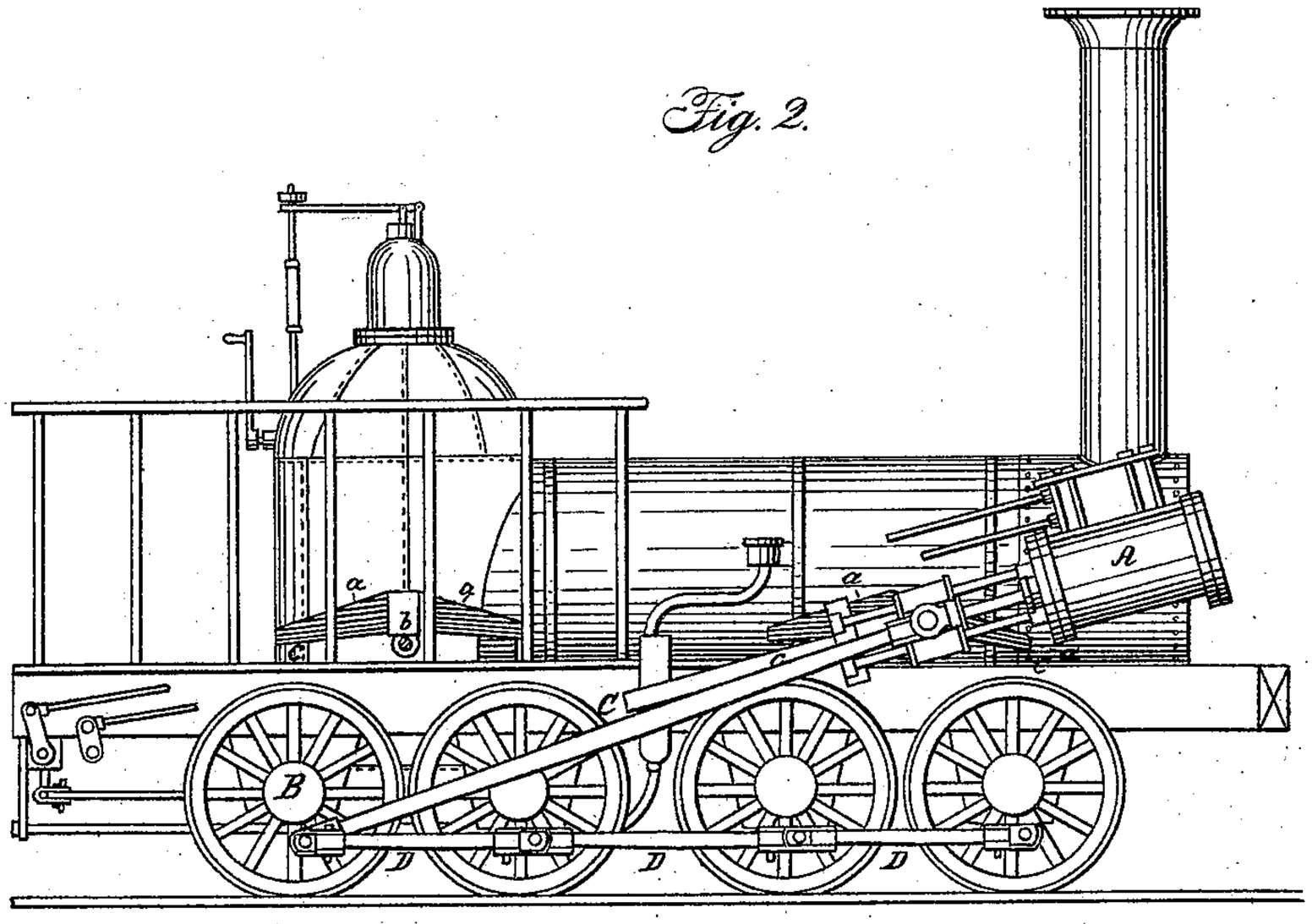


Fig. 2.



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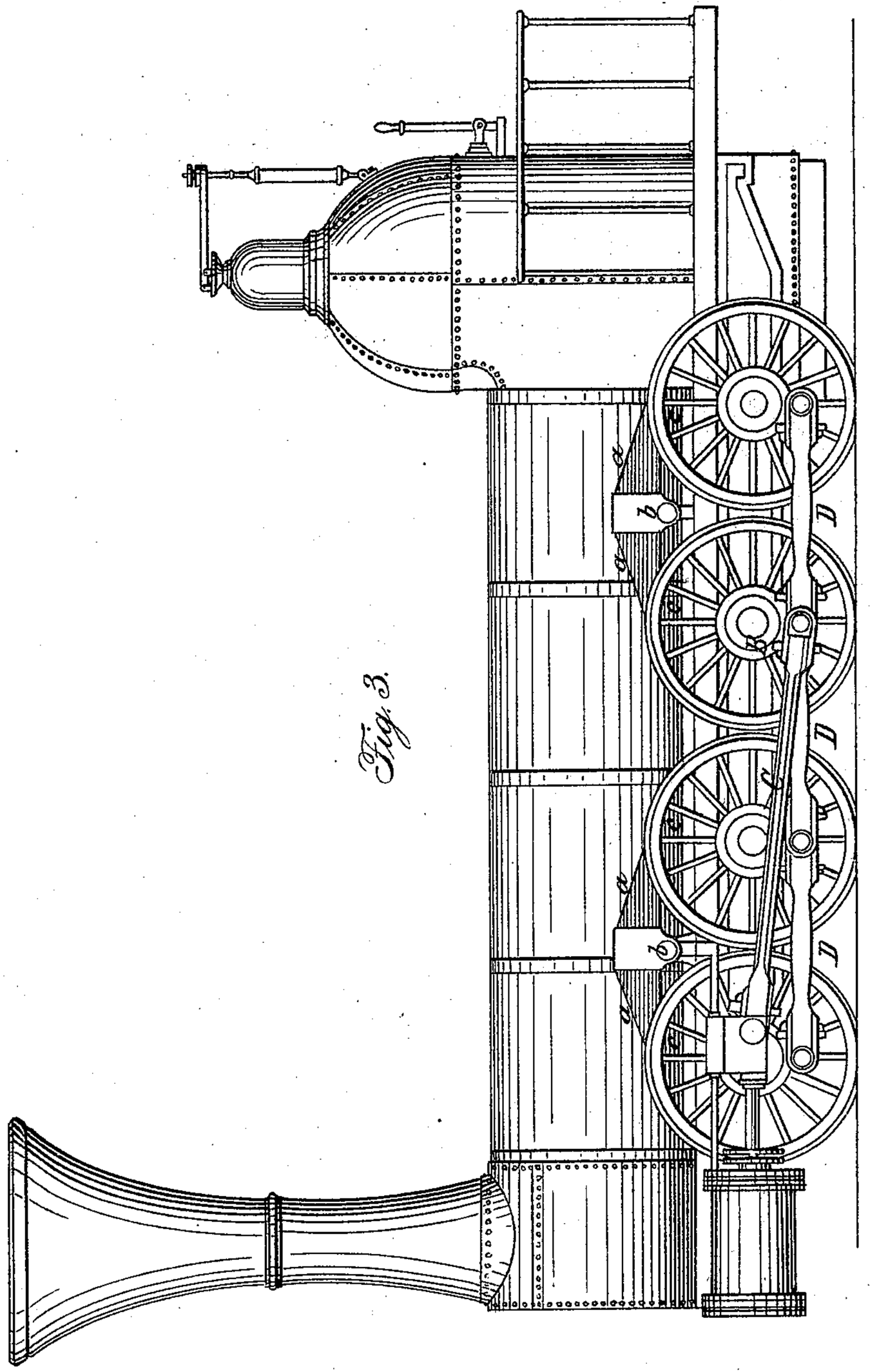

Fig. 3.

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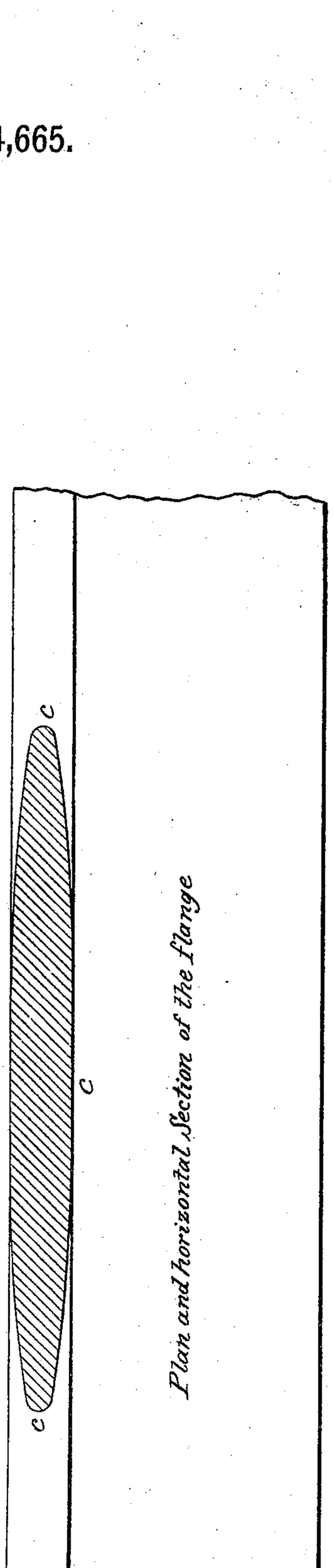
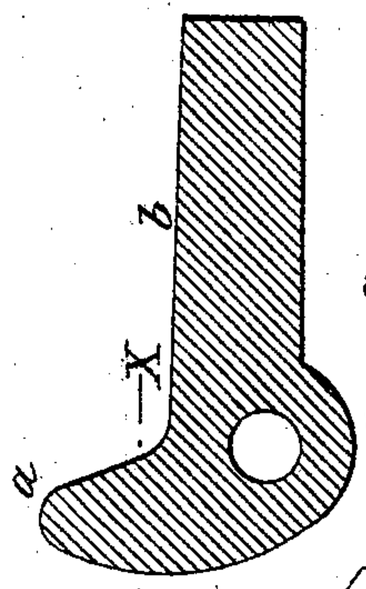


Fig. 5.

Plan and Horizontal Section of the flange



Cross Section

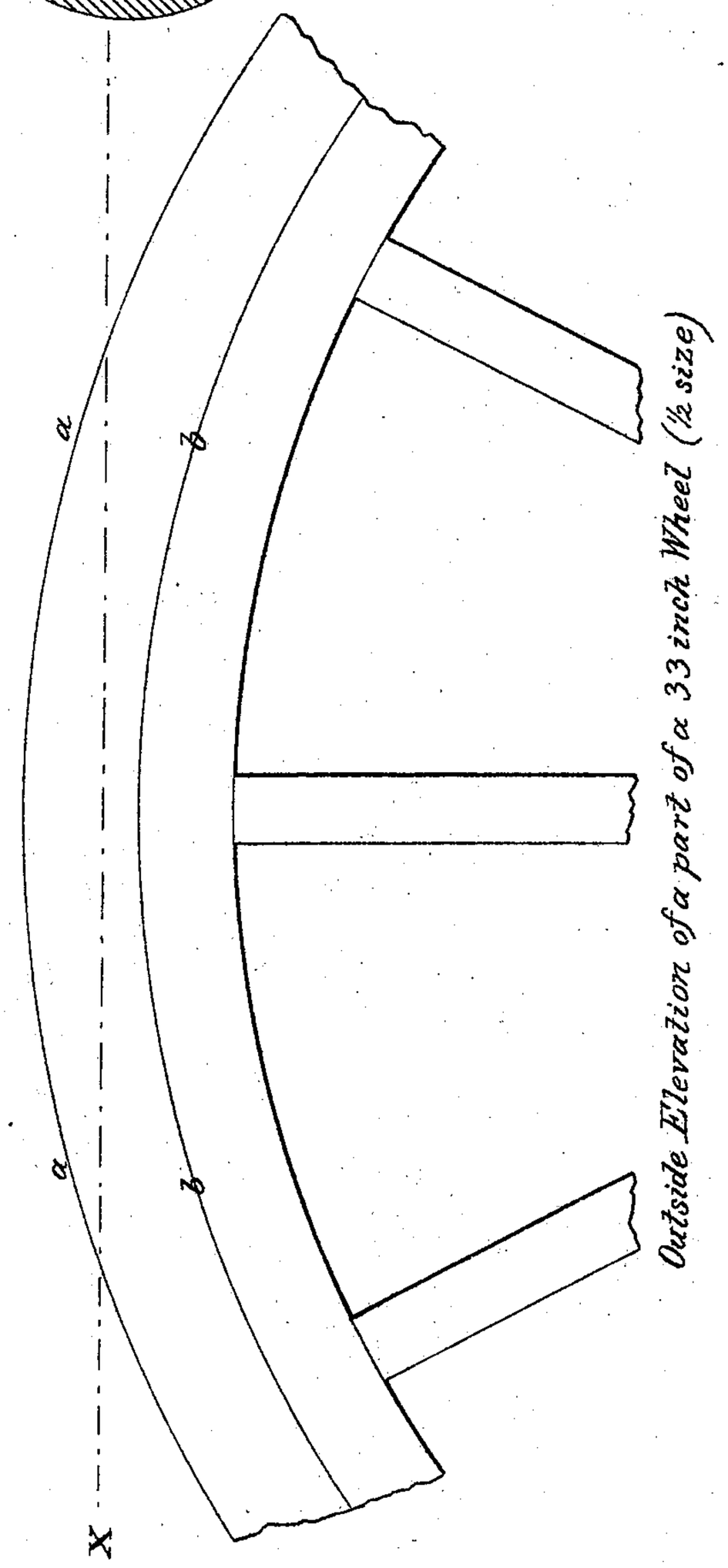


Fig. 4.

Outside Elevation of a part of a 33 inch Wheel (½ size)

UNITED STATES PATENT OFFICE.

ROSS WINANS, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN LOCOMOTIVE-CARRIAGES.

Specification forming part of Letters Patent No. 4,665, dated July 28, 1846.

To all whom it may concern:

Be it known that I, ROSS WINANS, of the city of Baltimore, in the State of Maryland, civil engineer, have made an improvement in the manner of constructing locomotive steam-engines, to be used on railroads, with six or eight driving-wheels; and I do hereby declare that the following is a full and exact description thereof.

In the combination and arrrangement of some of its parts my improved locomotive steam-engine resembles one that was built by Mr. Hopkins Thomas with six driving-wheels, and which was used on the Beaver Meadow railroad; but it was found to be objectionable on account of its too great tendency to run off the road, to obviate which is the object of this improvement.

In the accompanying drawings I have represented my improved engine under two different modifications or modes of construction.

Figure 1 is an engine with six wheels, all of which are driving-wheels. Fig. 2 is an engine with eight wheels, all of which are driving-wheels, with the cylinders in an inclined position. Fig. 3 is a similar engine, drawn to a larger scale, with the cylinders in an horizontal position, which position is preferred.

The motive power from the steam-cylinder A in the accompanying drawings is communicated directly to the pair of driving-wheels B by means of connecting-rod C, operating on crank-pins on one pair of the said driving wheels or cranks on their axles, the connecting-rods D D operating upon cranks on the other axles in a manner well understood, so as to make all six or eight wheels driving-wheels. The axles of the respective pairs of wheels are placed permanently parallel to each other, and to enable the wheels to arrange themselves in a position to pass readily around curves on the road, or through switches a lateral or end play is allowed to the axles when all the wheels are furnished with flanges. This lateral play of the axles and wheels may be obtained in various ways; but the mode which I prefer is to make the journals of the axles longer than the boxes in which they run, so as to allow of the requisite end play, or the boxes may be allowed to play laterally for this purpose. To enable an engine with six or eight wheels and all the axles parallel to each other to run with facility upon curves of short radius and through switches, one of the two following devices may be employed: first, a lateral play of about an inch to to each axle may be allowed, or double that play on the middle axle or axles, if the end ones have only the usual play; or, secondly, this lateral or end play may be dispensed with and the capacity of adaptation be still retained by forming the middle pair or pairs of wheels without flanges. To equalize the pressure on the respective driving-wheels, and consequently to distribute the weight or bearing of the locomotive on the rails on six or eight points, and the better to preserve the proper distribution of the weight on each of the wheels when passing over the uneven parts of the road, a vibrating spring, such as is shown at *a a* in the respective drawings, may be used. This vibrating spring turns on a fulcrum, *b*, below its center, and rods *c c* bear on its ends and upon the upper boxes of the two contiguous driving-wheels. A device analogous to this, consisting of a vibrating lever and spring, has been used by Messrs. Eastwick and Harrison in a locomotive-engine for which they obtained Letters Patent. A similar device was also used by Mr. Hopkins Thomas. The axles of the respective pairs of wheels of Mr. Thomas' engine were also arranged permanently parallel to each other, and lateral play was allowed to the axles and wheels, as herein described, for the purpose of promoting the easy passage through curves and turnouts, and the steam-power was transmitted from the cylinder to the respective driving-wheels by means of cranks and connecting-rods, as herein described.

The above devices mentioned as having been used by Mr. Hopkins Thomas I do not consider as new, either taken individually or in their combination with each other, they having been used and combined with each other, as above remarked, by that gentleman in the construction of an engine with six propelling-wheels, but without producing thereby a machine possessing the advantages obtained by my improvement, or capable of passing through the curves and turnouts of the road with the requisite ease, facility, and safety. By combining with the said devices the use of small wheels in place of the ordinary-sized driving-wheels of locomotive-engines, or those used in the unsuccessful attempt of Mr. Thomas, above referred

to, a new and original combination is obtained, and the difficulty of using six or eight driving-wheels with their axles parallel to each other will not only be obviated without danger from running off the track, and with the requisite facility of passing through curves and turnouts, as I have experimentally ascertained. With driving-wheels of the ordinary size with wrought-iron flanges this would not be the case.

I do not intend to claim the use of drawing-wheels for engines smaller than those ordinarily used as above mentioned as new when taken alone; but small wheels with wrought-iron flanges are an element which, when combined with the other devices enumerated, or with devices substantially the same, and with six or eight driving-wheels, forms a new combination which is a new and useful improvement. By small wheels, as above named, I mean wheels of the sizes ordinarily used on railroad-cars, of from thirty-three to forty inches in diameter. When of this size the wheels may be used with the tread and flanges of wrought-iron, should such be preferred, as from the proximity of the axles to each other and the smallness of the wheels, they will not, even when made of this material, have an objectionable tendency to mount upon the rail, and to run off the track.

The tendency of wheels on a railroad to be raised up by any obstacle or inequality on the inner side of the rails, so as to throw the engine off the track, is much lessened by the wheels being of small diameter, as will be manifest by reference to a diagram, Figs. 4 and 5. Let *a a* be the flange of a small wheel of which *b b* is the tread. Suppose a horizontal section be made so as to cut off a piece of the flange in the line *x x*. The plane of the section will be a curve on that side which is toward the tread, as at *c c c*, Fig. 5, and the quickness of the curvature will increase with the diminution of the size of the wheel, the flange being supposed to have its usual form. The liability of its extreme edge to come into contact with any obstacle or inequality on the inside of the rail will be diminished, and in case such contact takes place it will be at a less distance from the center of the wheel, as the wheel is smaller. So, also, the point of contact of the flange against the rail while in the process of guiding the engine along the track is at a less distance in advance of the center of the wheel than when large wheels are used to guide the engine. Consequently, were the wheel made to rise by its flange coming into contact with any obstacle, or by the energy with which the flange impinged against the rail, it would have to do so in a line more nearly vertical than it would were the curve *c c c*, Fig. 5, one of larger radius, as would be the case in a larger wheel—an advantage which is valuable and important in proportion as the distance between the front and hind axles of an engine having its axles parallel to each other is increased. The inertia of the load, therefore, will be most efficient in keeping small wheels on the track, and they will manifestly guide an engine round curves and through switches with greater ease and safety than large wheels.

Having thus fully set forth the nature of my improvement, what I claim, and desire to secure by Letters Patent, is—

The employment of wheels of small size, as above mentioned and described, with wrought or soft iron flanges, in combination with an engine having six or eight driving-wheels with axles parallel to each other and accommodating itself to curves and turnouts by any of the devices or modes herein described for that purpose, and having the power applied to all the axles by connecting-rods and cranks.

ROSS WINANS.

Witnesses:

JNO. W. B. LATROBE,

EDWIN L. BRUNDAGE.