

W. B. HOSFORD.  
Locomotive-Engine.

No. 216,275.

Patented June 10, 1879.

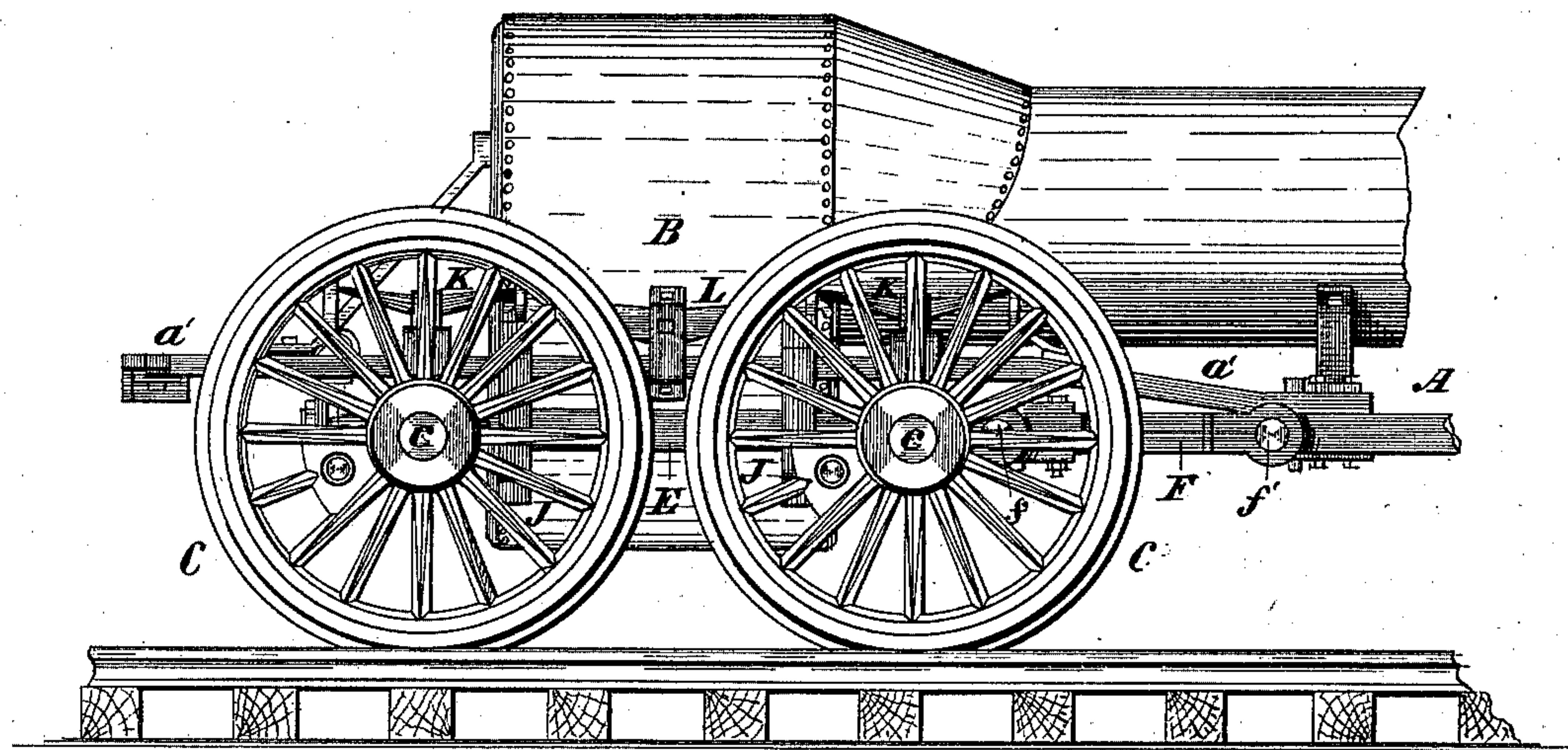


Fig 1

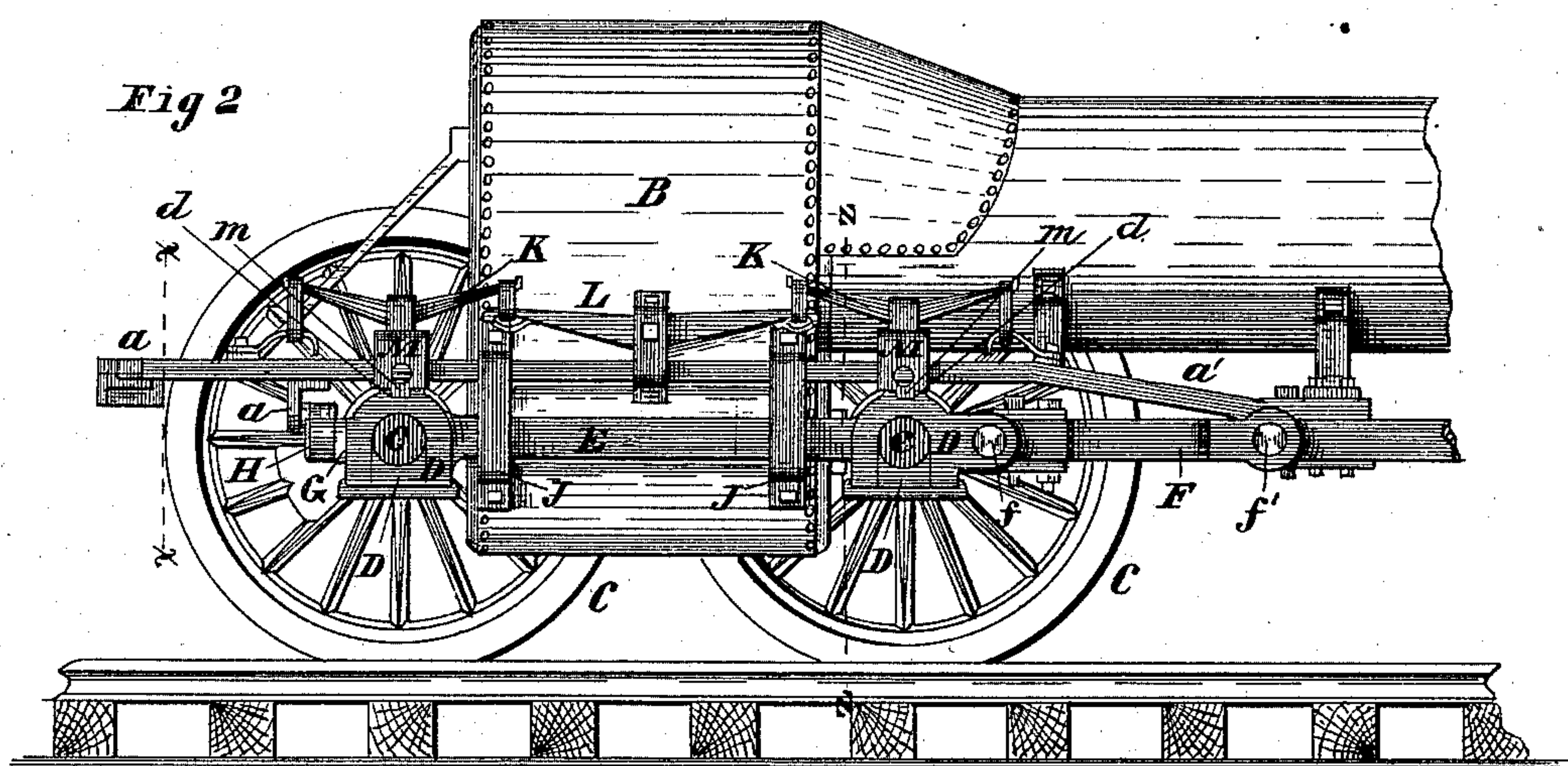


Fig 2

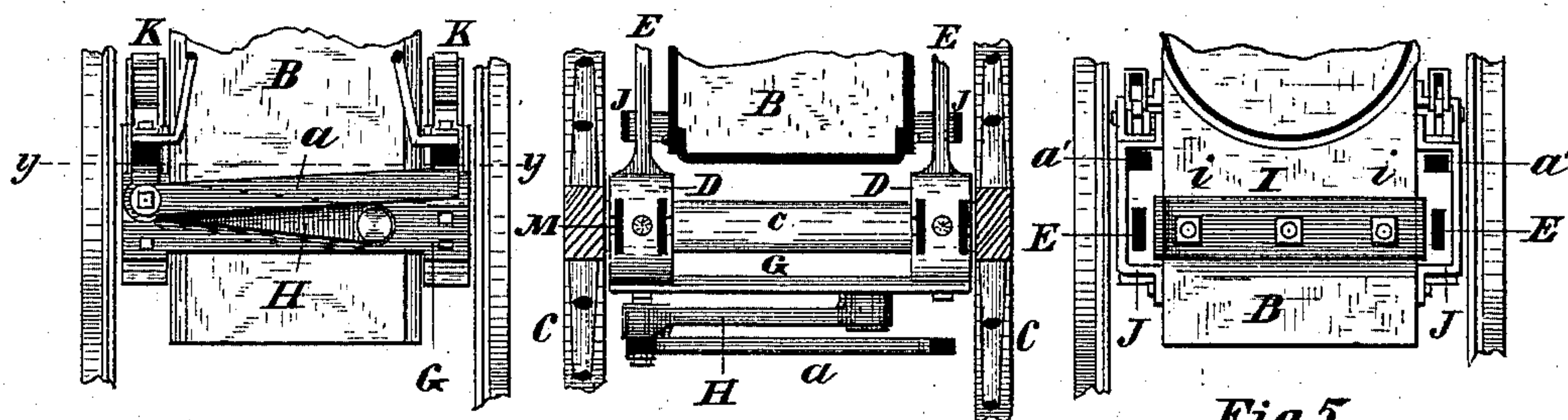


Fig 3

Fig 4

Fig 5

Witnesses

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## IMPROVEMENT IN LOCOMOTIVE-ENGINES.

Specification forming part of Letters Patent No. **216,275**, dated June 10, 1879; application filed March 24, 1879.

*To all whom it may concern:*

Be it known that I, WILLIAM B. HOSFORD, of Chicago, in the county of Cook, in the State of Illinois, have invented a new and useful Improvement in Locomotive-Engines, which is fully described in the following specification, reference being had to the accompanying drawings, in which—

Figure 1 represents a side elevation of a locomotive embodying my improvements, the front end thereof and truck being removed; Fig. 2, a similar view with the drive-wheels removed; Fig. 3, a detail transverse section, taken on the line *x x*, Fig. 2; Fig. 4, a plan section of the same, taken on the line *y y*, Fig. 3; and Fig. 5, a detail cross-section, taken on the line *z z*, Fig. 2.

My invention relates to the method of supporting the boxes in which the axles of the driving-wheels are mounted and the means for connecting the same to the main frame, so as to provide for the necessary yielding movement to neutralize the effects of the roughness or unevenness of the track.

The invention consists in mounting the axles of drive-wheels in boxes which are independent of the main frame of the engine.

It also consists in connecting the forward boxes to the main frame by a jointed rod, whereby the required vertical movement is permitted.

It also consists in devices for preventing lateral movement of the axle.

It also consists in various special devices and combinations of devices, all of which will be hereinafter more fully described, and the several improvements pointed out more definitely in the claims.

In the drawings, A represents the main frame of the engine, and B the boiler and fire-box, which may be of any ordinary construction and mounted in the usual way. The drive-wheels C are also of usual construction, and are attached to their axles *c*, as usual.

As heretofore constructed, the boxes for the axles of the drive-wheels of locomotives have been arranged in brackets or yokes depending from the sides of the main frame, and sliding up and down in these supports, being connected thereto by flanges, so as to prevent lateral motion. In this construction there is a

great amount of friction, and the boxes are soon worn as well as the yokes, thereby occasioning constant care and the application of special devices to prevent the effects of such wear.

In my improvement the boxes D of the drive-wheel axles are entirely independent of and free from the main frame, the axles being mounted therein and supported together with the boxes by the wheels on the track.

The boxes for the axles of the forward and trail wheels are connected by rods or bars E, which hold them permanently at the proper distance from each other. With this construction there can be no variation in the distance between the boxes on each side of the engine, and hence there can be no binding between the cranks and connecting-rod, but all the parts will have a fixed relation, and therefore perfectly true.

The forward box on each side of the engine is attached to the forward or dropping portion of the main frame by a connecting rod or bar, F, which is hinged by the pivotal joints *f f'*, respectively, to the box and to the main frame. This connection of the forward boxes to the main frame, it is evident, will keep the boxes and axle in their proper position, and at the same time will permit the vertical movement of the boxes necessary to provide for a certain amount of yielding between the frame and the wheels to accommodate unevenness of the track.

As already explained, the connecting-bars E hold the boxes and axles in the fixed proper relation to each other, and therefore in connection with the jointed bars F. The drive-wheels and axles are properly connected to the main frame in such a manner as to permit vertical movement and at the same time prevent any change in the relation of the front and rear axles by reason of wear or any other cause.

It is evident, however, that some provision must be made to prevent lateral movement of the axles with their boxes. This is effected by two devices. The boxes of the rear axle are connected by a cross-bar, G, and a stay rod or bar, H, is pivoted at one end to the cross-bar G and at the other end to the main frame A, as shown in Figs. 3 and 4 of the



drawings. In this instance the pivotal stay-rod H is hinged to a cross-piece, *a*, of the main frame, arranged below the side bars thereof; but it will readily be seen that this detail of construction is optional, and may be changed, it being necessary only that the cross-bar connecting the boxes shall be connected with the main frame in such a manner that the axle cannot move from side to side independently of the main frame. This connection must, however, be hinged or jointed in some way, so as to permit the necessary vertical motion.

To prevent lateral motion of the forward axle, a stop bar or plate, I, is fastened to the front of the fire-box casing, as shown in Fig. 5 of the drawings. The ends of this plate are preferably bent forward at right angles to the main body, so as to form broad stops, *i*, on each side of the engine, and they are arranged so as to be immediately opposite the connecting-rods E, just in rear of the front axle, and not quite touching the bars, but leaving just a little space for very slight play. These stops will, of course, prevent any lateral movement of the boxes except the slight play necessary, and provided for as described.

It is obvious that the particular construction of this stop-plate is immaterial, and, in fact, that the stops may be made independently of each other, and secured in any suitable manner to the fire-box or main frame. Guide-plates J are also provided on each side of the engine, within which the connecting-bars E are arranged.

In order to provide for the yielding vertical motion necessary in engines, the usual springs K are employed, one over each wheel, one end of which is linked to the main frame and the other to one end of the well-known equalizing bar or lever L. The springs are attached, respectively, to the yokes or branching supports M, which embrace the side bars *a'* of the main frame and rest loosely upon the axle-boxes. They are held from moving out of place by means of small projections, *m*, at their lower ends, which enter corresponding recesses or sockets *d* in the boxes, but they are not attached to the latter, and can readily be lifted therefrom whenever occasion requires.

The operation of this spring-support is the same as in the ordinary construction of loco-

motives, and will be readily understood without further explanation.

In this improvement I am enabled to lighten the main frame somewhat by dispensing with the box-supports and braces sometimes used, and by the free arrangement of the boxes I save a large amount of wear, which not only occasions frequent repairs, but also deranges the necessary relative position between the front and rear boxes. At the same time lateral motion of the boxes is prevented, and the required amount of vertical movement provided for, with an elastic support between the main frame and the boxes.

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

1. In locomotive-engines, the boxes of the drive-wheel axles, arranged independently of the main frame, in combination with mechanism for preventing lateral and longitudinal movement thereof, substantially as described.

2. The axle-boxes D of the forward drive-wheel axle, in combination with the main or supporting frame A and hinged bars or rods F, by which said boxes are connected with the main frame of the locomotive, substantially as described.

3. The axle-boxes of the drive-wheel, arranged independently of the main frame, in combination with the connecting rods or bars E, the hinged rods or bars F, and the main frame of the locomotive, substantially as described.

4. The axle-boxes of the trail-wheels, in combination with the cross-bar G connecting them together, pivoted stay-rod H, and main frame A, substantially as described.

5. The axle-boxes of the front drive-wheels, in combination with the connecting-rods E and stops *i*, to prevent lateral motion, substantially as described.

6. The free axle-boxes D, provided with sockets *d*, in combination with the branching spring-supports M, provided with studs or projections *m*, the side bars *a'*, and the springs K, substantially as described.

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Witnesses:

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