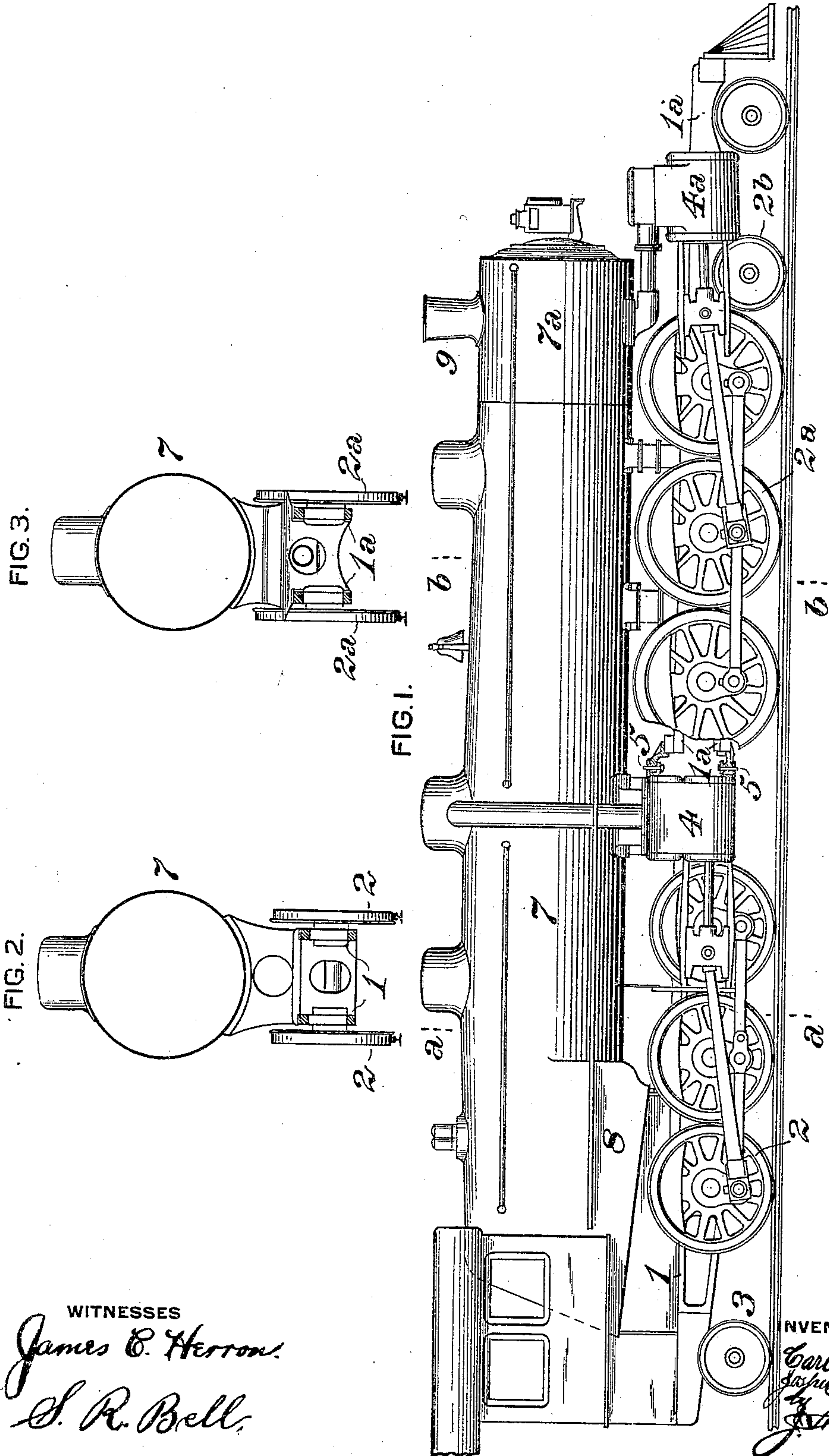


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 ARTICULATED COMPOUND LOCOMOTIVE.  
 APPLICATION FILED FEB. 14, 1910.

958,516.

Patented May 17, 1910.





# UNITED STATES PATENT OFFICE.

CARL J. MELLIN AND JOSHUA J. JONES, OF SCHENECTADY, NEW YORK.

ARTICULATED COMPOUND LOCOMOTIVE.

958,516.

Specification of Letters Patent.

Patented May 17, 1910.

Application filed February 14, 1910. Serial No. 543,658.

*To all whom it may concern:*

Be it known that we, CARL J. MELLIN and JOSHUA J. JONES, both of Schenectady, in the county of Schenectady and State of New York, have invented a certain new and useful Improvement in Articulated Compound Locomotives, of which improvement the following is a specification.

Our invention relates to locomotive engines of what is known as the articulated compound type, in which the boiler is supported upon two independent frames, which are pivotally connected so as to have the capacity of movement relatively one to the other, in order to afford the capacity of sufficient flexibility to enable a locomotive having a comparatively long wheel base to readily pass curves in the track.

Our invention is more particularly designed for application in locomotives of this type used in passenger train service, and its object is to enable a higher average steam pressure to be exerted in the high pressure and low pressure cylinders, as well as to admit of the location of the boiler in a proper balancing position without resorting to extreme extension or sub-division of it, thereby enabling the supporting points to be more favorably located, shorter moment levers to be obtained in turning into curves, and the necessity for abnormal clearance for the cab and front of the boiler in passing curves to be eliminated.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings: Figure 1 is a side view, in elevation, of an articulated locomotive embodying our invention; and, Figs. 2 and 3, vertical transverse sections through the same, on the lines *a a* and *b b*, respectively, of Fig. 1.

Our invention is herein exemplified as applied in an articulated compound locomotive specially designed for passenger train service, having a boiler, 7, which is carried on a rear frame, 1, and a front frame, 1<sup>a</sup>, which are coupled together, so as to be relatively movable in horizontal planes, by pivots, 5, as in ordinary practice with locomotives of this type. The rear frame, 1, is supported upon a plurality of driving wheels, 2, which are rotated by steam pressure applied in high pressure cylinders, 4, fixed to the frame, 1, and upon a trailing truck, 3. The front frame, 1<sup>a</sup>, is supported upon a plurality of driving

wheels, 2<sup>a</sup>, which are rotated by steam pressure applied in low pressure cylinders, 4<sup>a</sup>, fixed to the frame, 1<sup>a</sup>, and receiving the steam exhausted from the high pressure cylinders, 4, and upon a four wheeled leading truck, 2<sup>b</sup>.

The construction so far as above described, does not involve any features of novelty over those heretofore known and used.

Our invention consists in providing the rear and front frames of an articulated compound locomotive with driving wheels which are, as shown in the drawing, of larger diameter in one of said frames, *i. e.* in that to which the low pressure cylinders are connected, than in the other, the low pressure cylinder frame being, preferably and ordinarily, as also herein shown, the front frame.

It is apparent that the larger low pressure cylinders require longer time to be filled and emptied than the smaller high pressure cylinders, and while, in ordinary cases, the piston speed is approximately the same, and the volume of steam used is of the same relative proportions in both pairs of cylinders, if fewer revolutions of the driving wheels of the low pressure engine frame are made, longer time will be afforded during which the valve ports are held open at each stroke of the engine. This reduction of piston speed of the low pressure engine, and increase of duration of port opening, is obtained by the provision made under our invention of larger driving wheels in the low pressure engine frame than in that of the high pressure engine. A higher average pressure is thereby obtained, by reduction of back pressure in the low pressure cylinders, and a gain in the high pressure cylinders by reduction in the receiver pressures. The piston speed and stroke of one engine, as compared with the other, may be reduced or increased as conditions render desirable. A substantial difference in the diameter of the driving wheels of the high pressure and low pressure engine frames serves to bring the favorable conditions of both engines more closely together, and better result and higher speed of the combined engines are obtainable. A further advantage is obtained by the use of driving wheels of smaller diameter in the rear or high pressure engine frame, in permitting the application of a sufficiently deep and wide fire-box, 8, above the rear driving wheels, so that the boiler, 7, may be located in a proper



balancing position without being unduly extended or sub-divided. With a comparatively moderate length of boiler, the supporting points may be better located and shorter moment levers in passing into curves are obtained. The long boilers required with fireboxes entirely back of the rear drivers, necessitate abnormal side clearance and throw both the cab and the smoke box, 7<sup>a</sup>, outside the ordinary limit, even on curves of moderate radius. This objection is wholly avoided when a single chamber boiler can be set with a firebox over the driving wheels, as permitted by the reduced diameter of those of the rear engine frame.

We claim as our invention and desire to secure by Letters Patent:

1. An articulated compound locomotive having the driving wheels of its high pressure cylinder frame of smaller diameter than those of its low pressure cylinder frame.

2. An articulated compound locomotive having driving wheels in its low pressure cylinder frame which are rotated under lower piston speed than the driving wheels of its high pressure cylinder frame.

3. An articulated compound locomotive having a front low pressure cylinder frame, low pressure cylinders fixed thereto, a rear high pressure cylinder frame pivoted there-

to, high pressure cylinders fixed to said last recited frame, driving wheels supporting the front low pressure cylinder frame, and driving wheels, of smaller diameter, supporting the rear high pressure cylinder frame.

4. In an articulated locomotive, the combination of a rear frame, a front frame pivoted thereto, driving wheels supporting the front frame, driving wheels, of smaller diameter supporting the rear frame, and a boiler, carried on the rear and front frames and having a firebox extending over a pair of driving wheels of the rear frame.

5. In an articulated compound locomotive, the combination of a rear frame, high pressure cylinders fixed thereon, a front frame pivoted to the rear frame, low pressure cylinders fixed on the front frame, driving wheels supporting the front frame and rotated by pressure in the low pressure cylinders, driving wheels, of smaller diameter, supporting the rear frame and rotated by pressure in the high pressure cylinders, and a boiler carried on the front and rear frames.

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