J. H. NEWTON.

RAILWAY VEHICLE AND TRACK ADAPTABLE TO CHANGE OF GAGE.

APPLICATION FILED FEB. 5, 1914.

1,108,467.

Patented Aug. 25, 1914.

2 SHEETS—SHEET 1.

Fig 1.

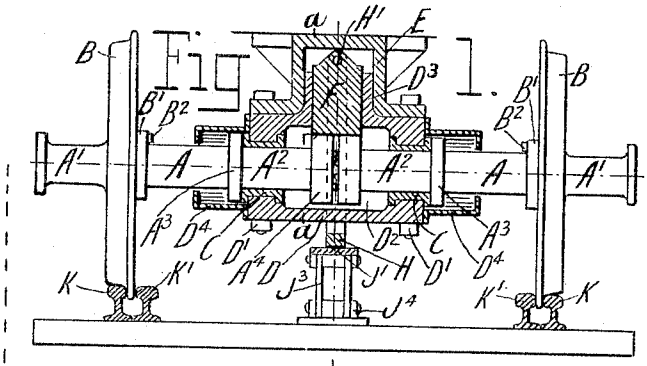


Fig 4.

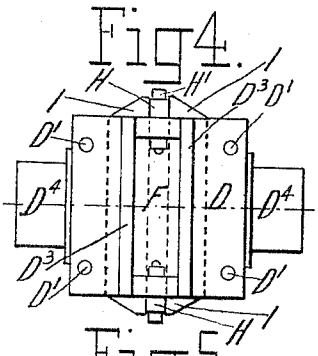


Fig 2.

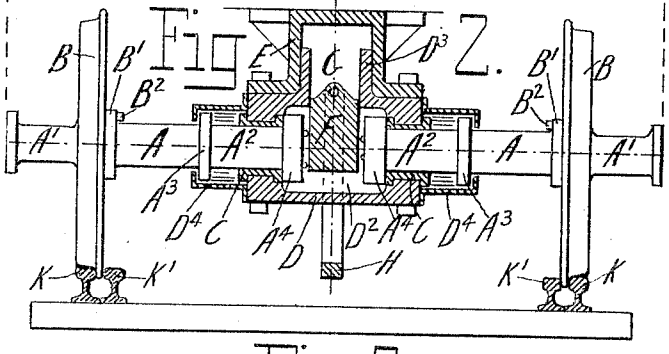


Fig 5.

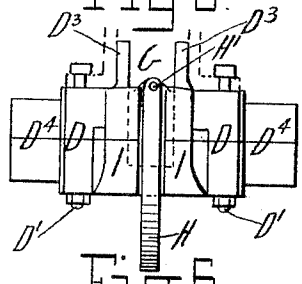


Fig 3.

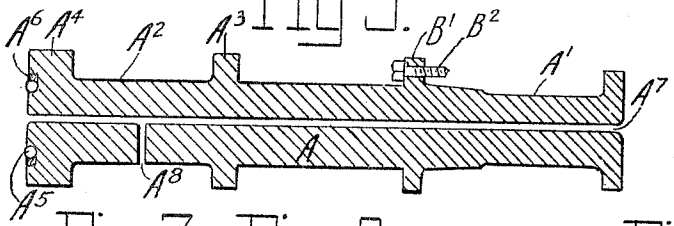


Fig 6.

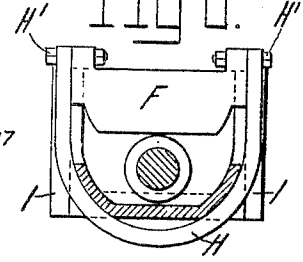


Fig 7.

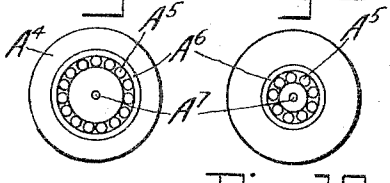


Fig 8.

Fig 9.

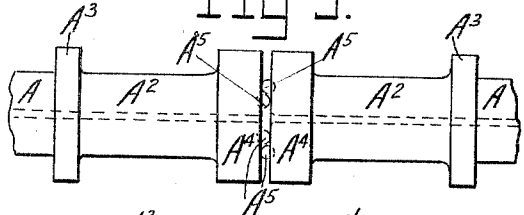
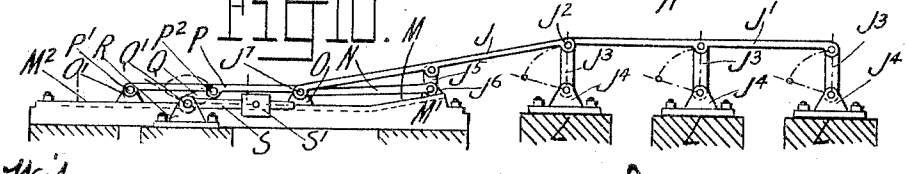


Fig 10.



Witnesses
W. H. Singleton
Effie L. Kremb

Inventor
James Harper Newton
by W. H. Babcock and Son
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

J. H. NEWTON.

RAILWAY VEHICLE AND TRACK ADAPTABLE TO CHANGE OF GAGE.

APPLICATION FILED FEB. 5, 1914.

1,108,467.

Patented Aug. 25, 1914.

2 SHEETS—SHEET 2.

Fig 11

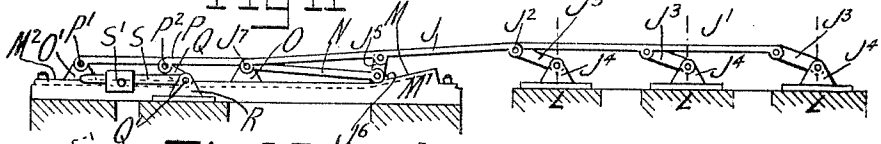


Fig 12.

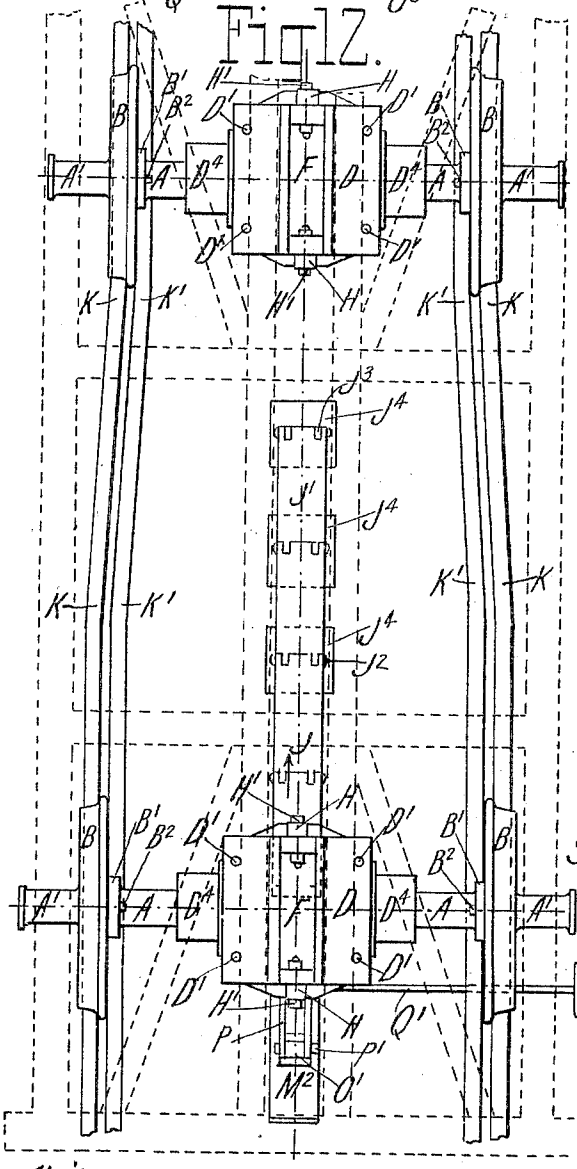
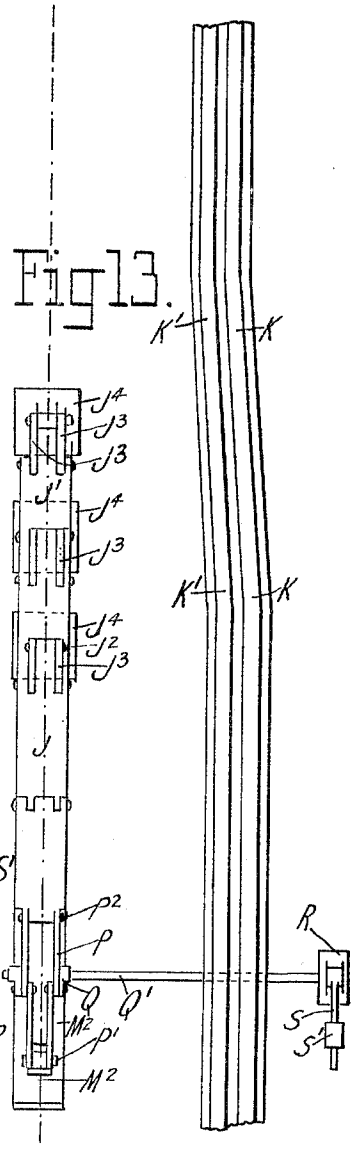


Fig 13.



Witnesses.
W. H. Singleton,
Effie L. Kremb

Inventor
James Harper Newton
by
Wm. H. Babcock & Son
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JAMES HARPER NEWTON, OF SYDNEY, NEW SOUTH WALES, AUSTRALIA.

RAILWAY VEHICLE AND TRACK ADAPTABLE TO CHANGE OF GAGE.

1,108,467. Specification of Letters Patent. Patented Aug. 25, 1914.

Application filed February 5, 1914. Serial No. 816,760.

To all whom it may concern:

Be it known that I, JAMES HARPER NEWTON, a citizen of the Commonwealth of Australia, residing at Sydney, New South Wales, in the Commonwealth of Australia, have invented new and useful Improvements Relating to Railway Vehicles and Tracks Adaptable to Change of Gage, of which the following is a specification.

The object of this invention is to provide a means by which railway vehicles (more particularly goods and cattle trucks, wagons, and the like) may be made serviceable for use on railway lines of different gages, such as exist in some of the States of the Commonwealth of Australia and elsewhere, and where the vehicles at present in use on lines of a certain gage cannot now be run upon lines of either wider or narrower gage, which necessitates the transference of the loading at considerable expense from one set of trucks to another set, provided at the stations where the break of gage occurs. In some cases the superstructure of such vehicles have been made interchangeable with the bodies of other vehicles, and are lifted from the rolling stock running on one gage of rails to rolling stock adapted to run on rails set at a different gage. This occasions considerable delay in the transport and delivery of both merchandise and live stock. To obviate these difficulties, and to insure the vehicles running safely on either gage rails, this invention provides means whereby the wheel axles, which are formed in two equal lengths, are caused, while running, either to lengthen or shorten automatically at the station where the two gages are joined by a double set of tapering lines.

Referring to the accompanying drawings, in which similar letters are used throughout the different views to indicate similar parts: Figure 1 is an elevation of an extendible axle and wheels set to narrow gage lines, with horse-shoe strap and block piece in elevated position, central supporting bearing, and, the suspending frame, all shown in longitudinal sectional elevation. Fig. 2 is an elevation and section of the parts in Fig. 1, but extended to the wider gage lines, with strap and block piece lowered into position between the ends of the half axles. Fig. 3 is a central longitudinal sectional elevation of a half axle, enlarged, showing the circular and roller bearing and oil feeding channels. Fig. 4 is a plan of the central bearing for supporting the axles, with sliding strap and block in position—the hanger for attaching to vehicle is omitted. Fig. 5 is a side elevation of Fig. 4, with strap and block piece in lowered position for broader gage adjustment. Fig. 6 is a vertical sectional elevation on line *a—a* of Fig. 5, with strap and block piece in raised position for narrow gage adjustment. Fig. 7 is an elevation of an axle end, showing the larger circular thrust ball bearing. Fig. 8 is a similar elevation to Fig. 7, showing the smaller circular thrust ball bearing to fit within the larger ball bearing. Fig. 9 is an elevation of the inward journal ends of axle halves, showing circular thrust ball bearings. Fig. 10 is a side elevation of the collapsible gradient track in raised position for operating horse-shoe strap and block piece. Fig. 11 is a side elevation of gradient track in collapsed position. Fig. 12 is a plan of broad and narrow gages formed with double rails as guides for wheel flanges, and fixed taper double connecting rails, also wheel axles and central bearings, and showing gradient track set in position for vehicles to pass from broad to narrow gage, the under framework of vehicle being shown in dotted lines. Fig. 13 is a half plan of Fig. 12, with gradient track in collapsed position, wheels and axles being omitted.

This invention is confined principally to the reconstruction of the axle parts of various kinds of railway vehicles, but excluding locomotives.

The type of axle illustrated is especially serviceable for railway vehicles having overhanging axle boxes. In such the framework is made wider than the over-all width of the wheels, therefore an extendible axle may be applied to such vehicles without materially altering the chief structural parts. A complete axle comprises the parts A made essentially of equal length so as to be interchangeable. The outer journal A^1 would run in the usual overhanging axle box bearing, while the inner journal A^2, formed between the collars A^3 and A^4, has its special bearing C to support it, two of which are provided in the hanger D, which is divided longitudinally and secured by the bolts D^1 to the under carriage attachment E. The collars A^4, which in Fig. 1 are shown in their close position, are provided with ball

bearings A^5 held in position by the screw threaded ring A^6, *vide* Fig. 7. The circular track in this figure is shown of larger diameter than in Fig. 8, for the purpose of insuring that the balls in each case will take their bearing on the contiguous axle end without coming into contact. The means for lubricating these bearings is by the central oil channel A^7, which is also in communication with the oil feeding channel A^8 for lubricating the journal A^2. The journals are necessarily longer than their bearings to provide for the lengthwise movement, which is equal to the difference between the two gages on which the wheels are required to run. The fixed collar B^1 is provided as an additional means for securing the wheels B, a screw threaded bolt B^2 serving as the attachment. The chambered part D^2 serves as an oil receptacle for lubricating both the bearings C, the inner collars A^4, and the ball bearings A^5. The distance block F, which is essentially of a width equivalent to the difference between the two gages, is likewise lubricated by means of the revolving collars A^4 as they run in the oil bath. These collars take their bearing against each other when the block F is raised above them, as in Fig. 1, but in its lowered position, as in Fig. 2, it serves as a thrust block separating the two inner collars, and having the ball bearings A^5 in contact with the sides. This occurs when the wheels B are at their widest gage. The upper guide flanges D^3 of banger D, being held in position between the side parts of the under carriage attachment E, serve the purpose of a chamber G (Fig. 2) for the block F to slide in, it being secured to the horse-shoe strap H by the bolts H^1. The said strap is retained within guides formed by the projecting pieces I (Figs. 4, 5, and 6). The straps and block piece move together when the former is brought into contact with the collapsible gradient track, which comprises the gradient part J and the level part J^1, the former being serviceable for producing the lifting movement to the strap H, while the level part is used to maintain it in the elevated position until one pair of wheels have passed from the broad to the narrow gage, the level part being made essentially of a length equal to the distance to be traversed by the wheels from one gage to the other. It is necessary that the block piece F be lifted quite clear of the collars A^4 before the axle A commences the shortening movement, which is brought about by confining the flanges of the wheels between the rails K and K^1 which converge from the broad to the narrow set of rails. The removal of the block F insures this taking place, and when the narrow gage is reached the said block takes its position on the top of the collars A^4. When the strap H is free from the track J^1, it will be seen that the block F will remain supported upon the collars, as in Fig. 1, until the movement of the vehicle is reversed by passing it from the narrow to the broad gage, when the lengthening of the axle takes place, and the block F, by its own gravity, descends into the position indicated in Fig. 2.

To permit of the gradient track being laid in the prone position, as in Fig. 11, the sloping part J is pivoted to the level part J^1 by the pin J^2, the said level part being, in turn, secured by means of pin connected links J^3 also attached to the fixed chairs J^4 upon the sleepers L. The part J is supported centrally by the pin connected link J^5 attached at its lower end to the slide block J^6 running upon the incline M formed at the inner end of the bed plate M^1. To the link J^5 is attached the connecting rod N secured at its other end by the pin J^7 to the slide block O, which is also connected to the jointed lever P secured at its outer end by the pin P^1 to the slide block O^1. The center pin P^2 connects the jointed lever with the cranked lever Q attached to the operating spindle Q^1 supported in the bearings R. This cranked lever is caused to pass from its forward to its backward position by means of the operating lever S having a weight S^1 to retain it in position.

Fig. 11 shows the device in its prone position, with the slide block J^6 moved down the sloping part M, and the slide blocks O and O^1 moved along the level part M^2 of the bed plate M^1. The parts J and J^1 are thus put out of action, and prevented from being an obstruction to traffic.

Having now described my invention, what I consider novel and desire to secure by Letters Patent is:

1. A railway vehicle axle divided into two interchangeable parts, each part being of an equal length and of similar formation, such formation comprising the outer journal made longer than the width of the bearing in which it is supported, the inner journal also made longer than the width of the bearing in which it is supported, the said inner journal being formed between collars which serve as stops to control the outward and inward movements of the axle parts, contiguous to the end collar of such journal the circular roller bearing formed in the end of each interchangeable part of the axle, the diameter of the said roller bearing on the one part being larger than the roller bearing on the other part so that when the half parts are contiguous to each other the ball bearings on the one end of the shaft will bear against the end of the adjacent shaft, each said half part of the axle having a centrally located oil feeding channel extending its entire length, and a channel communicating therewith and with the inner

journal, and being further provided with a collar as a means of attachment with a screw threaded bolt to the axle wheel, as described and shown, and for the purposes set forth.

2. As an attachment to a railway vehicle, the combination, with an extendible axle composed of two parts of equal length which are interchangeable, of, the centrally situated hanger divided horizontally at its center line, an oil chamber formed therein, a bearing on each side of the said oil chamber, guide flanges extending above the oil chamber and separated from each other to admit a distance block moving therein, and, an under carriage attachment fitting on either side of the guide flanges, and secured, by means of bolts, to the said hanger, as described and shown, and for the purposes set forth.

3. The combination, with a railway vehicle axle having circular roller bearings in the inner ends of each half part, of, a distance block which is supported by the inner end collars when said collars are contiguous to each other and the roller bearings in contact with the adjacent parts of the axle, and which, when separated, forms the distance piece between the said collars and is in contact with the roller bearings of each part of the axle, as described and shown, and for the purposes set forth.

4. The combination, comprising a central hanger, a central oil chamber therein, axle bearings located on either side of the said oil chamber, two projecting guide pieces on both sides of said hanger to form a guide channel, a horse-shoe strap, adapted to slide between said guide pieces, to which is attached at its upper end a distance block, the said block being raised or lowered simultaneously with the ascent and descent of the said horse-shoe strap, the circular part of said strap being adapted to run upon and to be moved by a gradient track arranged in position between railway lines, as described and shown, and for the purposes set forth.

5. In apparatus for operating the distance block piece of an extendible railway vehicle axle, the collapsible gradient track consisting of a jointed gradient part and a level part, secured to each other by pin attachments, supporting links which are the attachment of the said level part and fixed supporting chairs, the said links being adapted to oscillate upon the said chairs and moving with the level track part, a link, centrally supporting the gradient part, a slide block attached to said link and adapted to move with it, connecting links forming attachment with a central slide block which is adapted to run upon the sloping part of a fixed bed plate, a forwardly situated slide block attached both to the connecting rod of the central slide block and to the forward end of the gradient part, a jointed lever attached at one end to the forward end of the gradient slide block and at its other end to a similar slide block, both of the said slide blocks being adapted to slide upon the level part of a fixed bed plate, the said jointed lever being connected up to and operated by a pair of cranked levers, the operating spindle connecting said cranks, bearings supporting said spindle, an operating lever on said spindle, and, a weight on said lever adapted to be operated in the forward and backward positions so as to raise and lower the gradient track, as described and shown, and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES HARPER NEWTON.

Witnesses:
JOHN J. STONE.
HARRY A. SMEDLEY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."