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# No. 390/21.

APPLICATION DATED

1st February, 1921.

*Applicant (Actual Inventor)* ... ... CHARLES ROBERT PROSSER.
*Application and Complete Specification* ... Lodged 1st February, 1921.
*Application and Complete Specification Accepted* 14*th July*, 1921 Acceptance Advertised (Sec. 50) 26 July, 1921.

**Class 98.6.**

*Drawing attached.*

COMPLETE SPECIFICATION.

## "Improved means of adjusting the wheels of rolling stock to suit railway tracks of different gauges."

I, CHARLES ROBERT PROSSER, Motor Mechanic, of 382 Latrobe Street, Melbourne, in the State of Victoria, Commonwealth of Australia, a British subject, hereby declare this invention and the manner in which it is to be performed, to be fully described and ascertained in and by the following statement:—

This invention relates to devices for adjusting the wheels of railway rolling stock to suit tracks of different gauges and commonly known as "break-of-gauge" devices.

Various contrivances have hitherto been devised for the above purpose but the majority of such contrivances have been found ineffective or objectionable in practice.

The object of the present invention is to provide an improved device of the kind indicated the apparatus employed being simple and positive in operation and not liable to derangement and the track wheels being capable of adjustment along their axles to suit any desired gauge.

But in order that this invention may be better understood reference will now be made to the accompanying sheet of drawings which are to be taken as part of this specification and read herewith:—

Figure 1 is a part sectional view of the invention. For convenience of illustration the axially movable parts are shown in their inward or narrow gauge position at the left of the figure and in their outward or broad gauge position at the right thereof although in actual fact such parts move towards or away from each other simultaneously.

Figure 2 is a diagrammatic plan on a reduced scale showing the arrangement of the various track rails and other appurtenances for operating the adjustment gear.

Figure 3 is a diagrammatic side view of Figure 2.

Figure 4 shows a modified arrangement of the rails at the point of break-of-gauge.

In the drawings the numeral 2 indicates the main track rails of the narrow gauge and 3 those of the broad gauge. The hub of each main track wheel 4 is provided, according to the invention, with a sidewardly projecting sleeve 5 through which and the hub is an axial passage 6 whereby the wheel 4 is permitted to slide freely along the axle 7. The track wheels 4 are however caused to rotate with the axle by means of keys or feathers 8 carried on the axle and accommodated in corresponding grooves in the interior of the hub and sleeve 5.

The sleeve 5 of each wheel 4 is provided with an external screw thread 9. This thread engages a corresponding internal thread 11 in a sleeve or nut 12 which encircles the sleeve 5 and carries a major toothed wheel 13 and a minor toothed wheel 14.



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The sleeve or nut 12 is also provided with a screw thread 16 cut in an opposite direction to the thread 11. This thread 16 engages a corresponding external thread 17 surrounding a sleeve 18 on a minor or subsidiary flange wheel 19 which is fixed against both circumferential and longitudinal movement on the axle 7. The screw threads above described are preferably of a rounded character to increase their strength and easy running properties.

The subsidiary wheels 19 are adapted to run on subsidiary rails 21 which are disposed at a higher level than the main track rails 2 and 3 either by arranging the rails 21 on a suitable elevation 22 as seen in Figure 1 or by lowering the rails 2 and 3 by positioning them within a pit or depression below the rails 21.

The subsidiary rails 21 are provided at each end with inclined ramps 23 (Figure 3) on which the wheels 19 run onto the horizontal portion of the subsidiary rails so that the main track wheels 4, are raised clear of the main rails 2, 3 thereby transferring the load to the rails 21 and permitting of axial movement of the wheels 4 to suit different gauges without the flanges or the wheels coming into contact with the rails.

It will be obvious that instead of elevating the rails 21 in relation to the rails 2, 3, as above described and shown in Figures 1 to 3 the main track rails 2, 3, may be terminated as at 24 (Figure 4) near each end of the rails 21. In this case the ramps 23 may be dispensed with and by running the wheels 19 onto the rails 21 the load is transferred as in the previous embodiment from the main track rails to the subsidiary rails 21 and the wheels 4 may be moved axially in the gap between the rail ends 24.

The major and minor toothed wheels 13 and 14 are adapted to be respectively rotated by lower and upper toothed racks 26 and 27. These racks are positioned outside and adjacent the rails 21 and converge towards each other from end to end as seen in Figure 2 so that the toothed wheels remain in engagement with the racks whilst said toothed wheels move axially with the nuts 12. It will be evident that with the position of the parts reversed as caused by turning of the vehicle end for end the right hand minor toothed wheel and the left hand major toothed wheel will be brought into operation instead of the other toothed wheels as in Figure 1.



It will moreover be evident that with the train moving continually in the one direction the direction of axial movement of the wheels 4 will depend on whether the major or minor toothed wheel is in operation at a particular side of the track. Thus by appropriate positioning of the racks 26, 27 the wheels may be changed repeatedly from one gauge to another with the vehicle moving continuously in the same direction.

In operation the subsidiary wheels 19 are run onto the rails 21 thereby transferring the load from the main rails 2, 3, to the subsidiary rails 21 and permitting of axial movement of the wheels 4 without fouling the main rails as aforesaid. The major toothed wheel 13 near one end of the axle now engages the lower rack 26 whilst the minor toothed wheel 14 at the other end of the axle engages the corresponding upper rack 27 as shown in Figure 1. This causes the internally threaded sleeves or nuts 12 to rotate, one nut turning faster and the other slower than the flanged wheels 19 and 4 which rotate together on the axle 7. This differential rotation of the toothed wheels in relation to the subsidiary load carrying wheels 19 and the axle causes the nuts 12 to simultaneously move inwardly or outwardly along the sleeves 18 according to the direction of rotation of the wheels as the rolling stock moves in one direction or the other or, if the vehicle continues to move in the same direction the direction of the movement of the wheels along the axles will depend on whether the major or minor toothed wheel is in operation at a particular side of the track as aforesaid. Synchronously with the axial movement of the nuts 12 the main track wheels 4 move inwardly or outwardly within and in the same direction as said nuts owing to the different direction of the threads 11 and 16. It will thus be seen that the track wheels 4 are moved towards or from each other by the combined axial movement of the nuts 12 and sleeves 5 simultaneously but independently in the same direction.

By the convergent arrangement of the toothed racks 26 and 27 as in Figure 2 it will be evident that the toothed wheels 13 and 14 will remain in engagement with said racks as they move inwardly or outwardly along the axle. Immediately the toothed wheels leave the racks the track wheels 4 are automatically locked in their new position and rotate with the axle through the medium of the feathers or keys 8. The subsidiary

wheels 19 now leave the rails 21 and the main wheels 4 engage the rails of the track 2 or 3 to which they have been converted.

Having now fully described and ascertained my said invention and the manner in which it is to be performed, I declare that what I claim is:—

1. Improved means of adjusting the wheels of rolling stock to suit railway tracks of different gauges, consisting in the combination with main track wheels mounted to move longitudinally on and to rotate with their axle of a screw and nut mechanism adapted for moving said wheels towards or away from each other, means to automatically actuate said screw and nut mechanism and subsidiary wheels adapted to run on subsidiary rails to transfer the load from the main track rails for the purpose set forth.

2. Apparatus according to Claim 1 wherein the screw and nut mechanism comprises an internally threaded sleeve or nut surrounding the axle and have oppositely directed screw threads adapted to respectively engage corresponding threads on the main and subsidiary wheels for the purpose set forth.

3. Apparatus according to Claims 1 or 2 wherein the screw and nut mechanism is operated by toothed wheels surrounding the axle and engaging toothed racks on the permanent way.

4. Apparatus according to Claim 3 characterised by major and minor toothed wheels adapted to respectively engage lower and upper toothed racks substantially as described.

5. Apparatus according to any of the foregoing claims wherein the main track wheels are slidably attached by keys or feathers to the axle to rotate therewith through the medium of the subsidiary wheels which are fixed against rotation and longitudinal movement on the axle substantially as described.

6. Apparatus according to any of the foregoing claims wherein the subsidiary wheels are of less diameter than the main track wheels and the subsidiary rails are disposed at a higher level than the main track rails substantially as and for the purpose set forth.



7. Improved means of adjusting the wheels of rolling stock to suit railway tracks of different gauges consisting in the combination of an internally threaded sleeve or nut surrounding the axle of the main track wheels, a toothed wheel carried by said nut and a stationary toothed track positioned to engage said toothed wheel and rotate the nut to move the main track wheel along its axle.

8. Improved means of adjusting the wheels of rolling stock to suit railway tracks of different gauges, consisting in the combination of main track wheels keyed to their axle to rotate therewith and move longitudinally thereon, subsidiary wheels fixed to the axle and adapted to engage subsidiary rails, externally threaded sleeves on each of said wheels and a nut having oppositely directed screw threads adapted to respectively engage corresponding opposite threads on said sleeves of the main and subsidiary wheels whereby the main track wheels are caused to move axially in relation to said nut in the same direction as and synchronously with the axial movement of the nut in relation to the subsidiary wheels and axle for the purpose set forth.

9. Improved means of adjusting the wheels of rolling stock to suit railway tracks of different gauges, consisting in the combination and arrangement of parts substantially as described and illustrated with particular reference to Figures 1 to 3 of the accompanying drawings.

10. Improved means of adjusting the wheels of rolling stock to suit railway tracks of different gauges, consisting in the combination and arrangement of parts substantially as described and illustrated with particular reference to Figures 1 and 4 of the accompanying drawings.

Dated this 1st day of February, A.D. 1921.

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Agents for Applicant.

Witness—Jack Nance.



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CHARLES ROBERT PROSSER.

*Rolling Stock.*

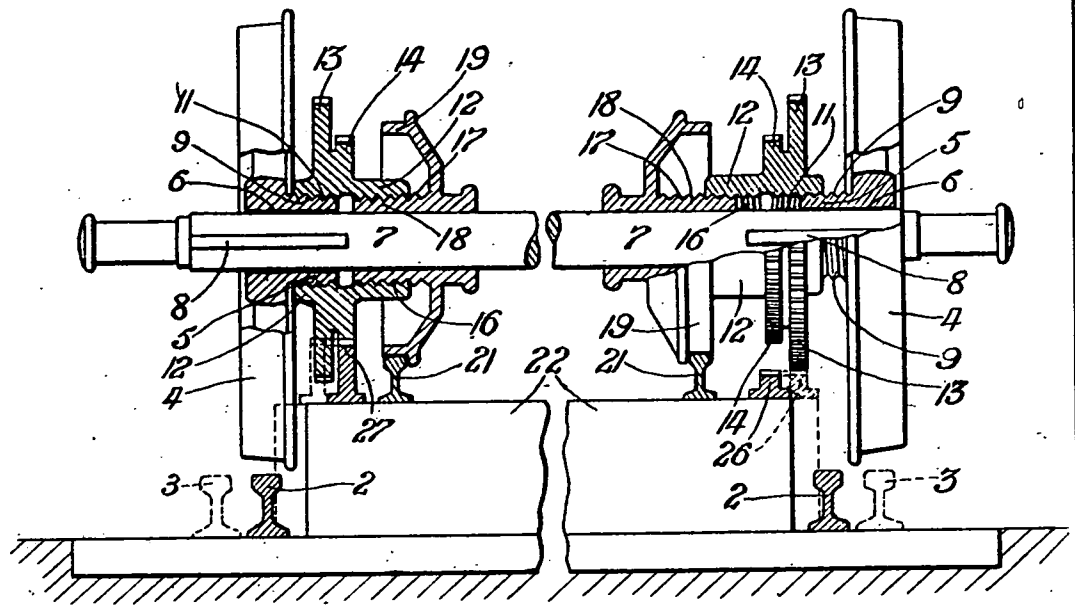


*Fig. 1.*

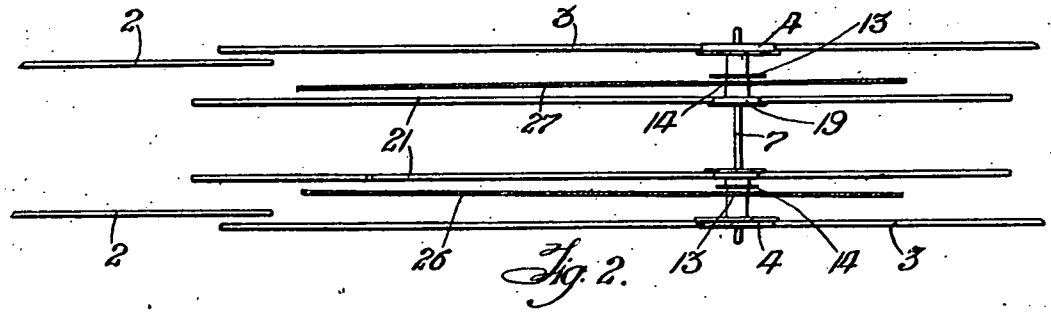


*Fig. 2.*

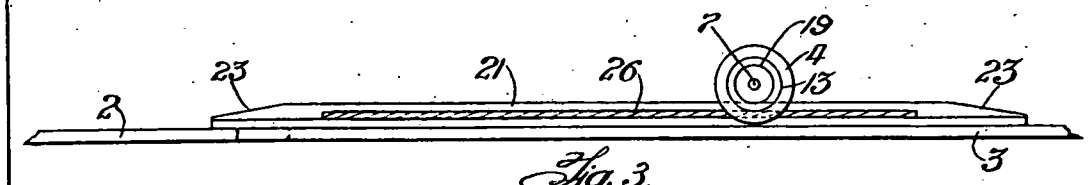


*Fig. 3.*

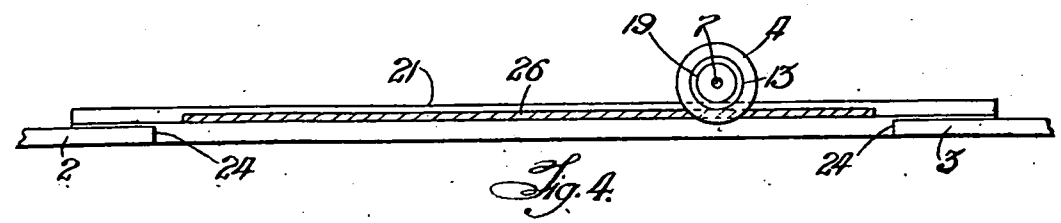


*Fig. 4.*