PATENT SPECIFICATION

365,701

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PROVISIONAL SPECIFICATION.

Improvements in Automatic Couplings for Railway Vehicles, Specially Applicable to Toy Railways.

I, FRANK HORNBY, of Meccano Limited, of 236, Binns Road, Old Swan, Liverpool, British, do hereby declare the nature of this invention to be as follows:—

This invention relates to automatic couplings for railway wagons the invention being specially applicable to the couplings of toy or model railway rolling stock. In such latter rolling stock it is desirable that the coupling device should be of a light and somewhat simple character and also that the coupling should be available for engaging with the couplings of other toy railway systems which may not be of exactly the same type. Again, it is desirable that such devices should be adapted to couple automatically when the rolling stock to be engaged is on a curved stretch of track. The present invention is designed to meet these requirements.

According to this invention each coupling element comprises a hook to which is pivoted a link, wide shackle, or the like adapted, when the coupling elements of two wagons come together, to be lifted and fall into engagement with the opposing coupling hook of the other wagon. In order to effect this lifting of the pivotal shackle the forward part of the coupling hook is bevelled. A stop or abutment is also provided at the rear of the coupling hook to limit the inward engaging movement of the link shackle preparatory to its drop-in engagement behind the coupling hook. When both shackles have dropped into engagement behind their respective hooks and the coupling of the wagons made, the shackles or links overlap and in order to disengage the coupling the lower link is lifted, this action raising the other link and freeing both links from their hooks. The lifting may be effected by means of an extension on the link beyond its pivot which may be carried out towards the side of the wagon to give ready accessibility for operation.

In a suitable construction each wagon is provided with a coupling hook formed of a single stamping, the coupling hook projecting from a sole plate secured to the wagon, and having an inclined or bevelled impact face in advance of the hook and an abutment standing up at the rear of the hook, the abutment and hook forming a recess into which a pivotal link or shackle on the opposite coupling member is adapted to fall. The link or shackle is pivoted in lugs bent up from the sole plate and the link may be of wire bent into a somewhat U-formation the outer limb of the link or shackle being slightly curved and of comparatively wide extent. The outer limb of the coupling link or shackle may be bevelled to form a knife-edge in order to avoid any abutting contact of the two links of both coupling devices when these approach to couple two wagons of the rolling stock, the leading knife-edges ensuring that the links as they approach shall miss each other and by contacting with the bevelled outer ends of the coupling hooks ride up such bevelled edges to meet the abutments at the rear and drop into the recesses behind the hooks. The links are raised to disengage by means of an extension at one side of each link, preferably integral therewith, which forms an operating handle by means of which the link may be turned upwardly in its bearings, this operating handle ultimately meeting a stop or abutment on the sole plate and so limiting the upward movement of the link. This is desirable as otherwise the impact of the two links in the operation of coupling the wagons together might posibly deflect the link so far upward as to throw it to the rear of its pivots where it would remain instead of falling behind the opposing coupling hook.

The coupling hook may be rigidly secured to the frame of the wagon or it may be pivotally secured thereto so that the position of the coupling hook may be slightly adjusted. When the coupling elements of two wagons are engaged the pivotal links or shackles slightly overlap, the weight of the upper link acting to keep the lower link in secure engagement with the opposing hook but, by merely lifting the lower link, both links are disengaged from their hooks and the coupling freed.

When in engagement the pull as between the wagons is taken by the links engaging the hooks and the push between

[*Price* 1/-]

the wagons is taken by the engagement of the links with the rear abutments. When rigidly secured to the wagons the disposition of the coupling hooks at opposite ends of each wagon is such that any two coupling hooks shall not abut together but shall pass one another at the side.

By making the outer limbs of the links or shackles of comparatively wide extent and slightly curved an effective coupling engagement is obtained even though the wagons may be relatively inclined at a considerable angle as when they are on a track of sharp curvature.

Dated this 17th day of November, 1930.

A. J. DAVIES,
Patent Agent.
24, Moorfields, Liverpool.

COMPLETE SPECIFICATION.

Improvements in Automatic Couplings for Railway Vehicles, Specially Applicable to Toy Railways.

I, FRANK HORNBY, of Meccano Limited, of 236, Binns Road, Old Swan, Liverpool, British, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to automatic couplings for railway wagons the invention being specially applicable to the couplings of toy or model railway rolling stock. In such latter rolling stock it is desirable that the coupling device should be of a light and somewhat simple character and also that the coupling should be available for engaging with the couplings of other toy railway systems which may not be of exactly the same type. Again, it is desirable that such devices should be adapted to couple automatically when the rolling stock to be engaged is on a curved stretch of track. The present invention is designed to meet these requirements.

The invention relates to couplings for railways particularly toy railways of the type in which the coupling member on each wagon is provided with a wire link or shackle pivoted in the hook and adapted to be raised by the coupling hook of another wagon and drop behind it. In such couplings a shackle of slotted plate form has been pivoted in downwardly bent lugs formed in the hook and sole plate stamping which was pivotally secured to the wagon, and in other arrangements stops have been provided limiting the upward pivotal movement of the shackles, while in other forms of coupling, embodying a shackle and hook, coiled springs have been provided for maintaining the coupling in a somewhat central position.

According to this invention the automatic coupling which is specially applicable to toy railways comprises a coupling hook and sole plate formed integrally as a single stamping, the sole plate being pivotally secured to the wagon and having two upwardly bent lugs disposed one on each side of the hook in which a wire link or shackle is pivoted, an arm forming an extension of the link pivot being adapted to engage a stop on one lug to limit the upward movement of the link. Further features of the invention relate to means for maintaining the hook of the coupling central with the track in the case of rolling stock having a bogey undercarriage.

In the accompanying drawings Figs. 1 to 5 show the invention applied to a toy railway wagon, Fig. 1 being an elevation partly in section, Fig. 2 an end view and Fig. 3 a plan of the wagon with coupling elements. Fig. 4 is a diagrammatic view showing the position of the coupling elements of two wagons during the primary engaging movement, while Fig. 5 shows the coupling completely engaged. Figs. 6 to 9 show the type of coupling adopted in the case of a pullman car running on bogies, Fig. 6 being a fragmentary elevation partly in section of the end of a pullman car and one bogey, Fig. 7 being an end view and Fig. 8 an inverted plan. Fig. 9 is a diagrammatic inverted plan showing the position of the bogey and coupling when on a curved stretch of railway track.

Referring in the first instance to the arrangement shown in Figs. 1 to 5, the wagon 1 is provided at each end with a coupling hook 2 formed preferably of a single stamping, the hook projecting from a sole plate 3 secured to the base of the wagon, and having an inclined impact face 4 in advance of the hook and an abutment 5 standing up at the rear of the hook, the abutment 5, and hook 2 forming a recess 6 into which a pivotal link 7 on the opposite coupling member is adapted to fall. The link is pivoted at 12 in lugs 8 bent up from the sole plate 3 and the link 7 may be of wire bent into a somewhat U-formation, the outer limb 7*a* of the link being slightly curved and of comparatively wide extent. The outer limb 7*a*

of the coupling link may be bevelled as shown to form a knife-edge 9 in order to avoid any abutting contact of the two links of both coupling devices when these approach to couple two wagons of the rolling stock, the leading knife-edges ensuring that the links 7 as they approach shall miss each other and by contacting with the inclined faces 4 of the coupling hooks ride up such faces to meet the abutments 5 at the rear and then drop into the recesses 6 behind the hooks. The action of coupling two wagons is shown in Figs. 4 and 5. In Fig. 4 the primary engagement is taking place, the knife edges 9 of the two links 7 having just passed each other, causing the right hand link to be above the left hand link which is riding up the inclined face 4 of the hook. As the wagons approach further to the position shown in Fig. 5 the lower hook 7 clears the tip 4*a* of the hook on the opposite wagon and falls into the recess 6 thus permitting the other link 7 to drop into its corresponding recess.

The links are raised to disengage the coupling by means of an arm 10 at one side of each link and preferably integral therewith, which forms an operating handle by means of which the link may be turned upwardly about its pivots 12, this arm 10 ultimately meeting a stop 11 on the lug 8 and so limiting the upward movement of the link. This is desirable as otherwise the sharp impact of the links in the operation of coupling the wagons together might possibly deflect the links so far upward as to throw them to the rear of their pivots 12 where they would remain, instead of falling behind the opposing coupling hooks.

The coupling hook may be rigidly secured to the frame of the wagon but it is preferably pivotally secured thereto so that the position of the hook may be slightly adjusted. This is the arrangement shown in Figs. 1 and 2 where the sole plate 3 is pivoted to the base 1*a* of the truck 1 by means of an eyelet 13 passing through the sole plate 3 and the base 1*a*. With such an arrangement a more certain engaging action may be effected when two wagons are to be coupled on a curve stretch of rail, the couplings accommodating themselves to the central line of the track by reason of their pivotal connection. To provide for the angular movement of the sole plate 3 of the hook about its pivot 13 a slot 14 is cut in the short front skirt 15 of the wagon.

In a modification, Figs. 6 to 9, the coupling is shown applied to the case of a pullman car 1*b* with bogey undercarriage 16 pivoted thereto at 18. Owing to the considerable length of this type of car when rounding a curve its ends considerably overhang the centre line *a*—*a* of the track, Fig. 9, and the coupling hooks would not properly engage each other unless some means where provided for maintaining them in line with the centre line of the track. With this object the sole plate 3*a*, Fig. 6, is made somewhat longer than in the form previously described and is pivoted, say by an eyelet 13*a*, to the floor 17 of the car, and projects through a slot 14*a* in the front member 15*a* of the car. The bogey 16 is pivoted in the usual manner at 18 and carries a light spring 19 secured at 20 to the table of the bogey. The forward end of this spring also projects through the slot 14*a* and engages a lug 21 on the plate 3*a* of the coupling hook. The action of this spring tends to centralise the hook with the longitudinal axis of the bogey. Consequently when the bogey is on a curved stretch of rail its angular displacement about its pivot 18 relative to the longer pullman car, as shown in Fig. 9, cause the hook to be pushed over to the side of its slot 14*a* by the spring wire 19. For instance as shown in Fig. 9 the hook has been pushed to the limit of its slot 14*a* and is then more or less centrally disposed with reference to the centre line *a*—*a* of the track, the resilience of the spring 19 permitting the bogey to assume a greater angularity without damaging the connection. With such an arrangement the coupling hook is moved to one or other side under the control of the spring 19 and always in line with the curvature of the track.

When the coupling elements of two wagons are engaged the pivotal links 7 or shackles slightly overlap as shown in Fig. 5, the weight of the upper link acting to keep the lower link in secure engagement with the opposing hook 2 but, by merely lifting the one lower link by its arm 10, both links are disengaged from their hooks and the coupling freed.

When in engagement the pull as between the wagons is taken by the links 7 engaging behind the hooks 2 and the push between the wagons is taken by the engagement of the links 7 with the rear abutments 5. If rigidly secured to the wagons, that is not pivoted, the disposition of the coupling hooks at opposite ends of each wagon looked at in plan is such that any two hooks shall not abut together but shall pass one another at the side.

By making the outer limbs 7*a* of the links 7 of comparatively wide extent and slightly curved as shown an effective coupling engagement may be obtained when the wagons are relatively inclined at a considerable angle on a track of sharp curvature, even though the hooks be rigidly

connected to the wagon, instead of pivoted.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An automatic coupling for railway vehicles specially applicable to toy railways in which the coupling hook and sole plate formed as a single stamping has two upwardly bent lugs disposed one on each side of the hook in which a wire link or shackle is pivoted, an arm forming an extension of the link pivot being adapted to engage a stop on one lug to limit the upward movement of the link.

2. A coupling as claimed in Claim 1 for use with rolling stock having a bogey undercarriage, in which the hook is pivotally mounted on the upper carriage and its pivotal movement is controlled by means of a resilient connection between the hook and the bogey adapted to maintain the hook always in line with the direction of the bogey and the track rails.

3. The improved automatic coupling for railway vehicles specially applicable for toy railways substantially as described and shown in the accompanying drawings.

Dated this 4th day of June, 1931.

A. J. DAVIES,
Patent Agent.
24, Moorfields, Liverpool.

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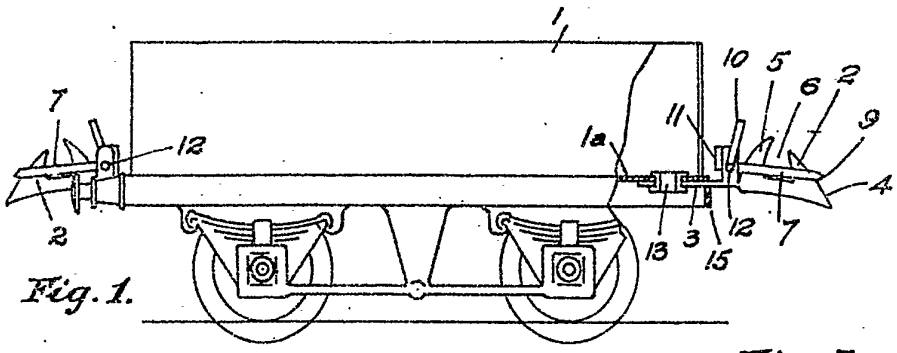


Fig. 1.

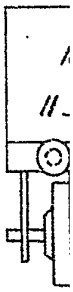
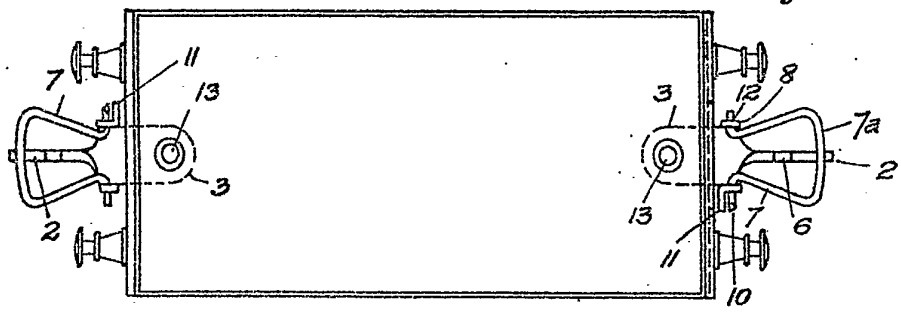


Fig. 3.



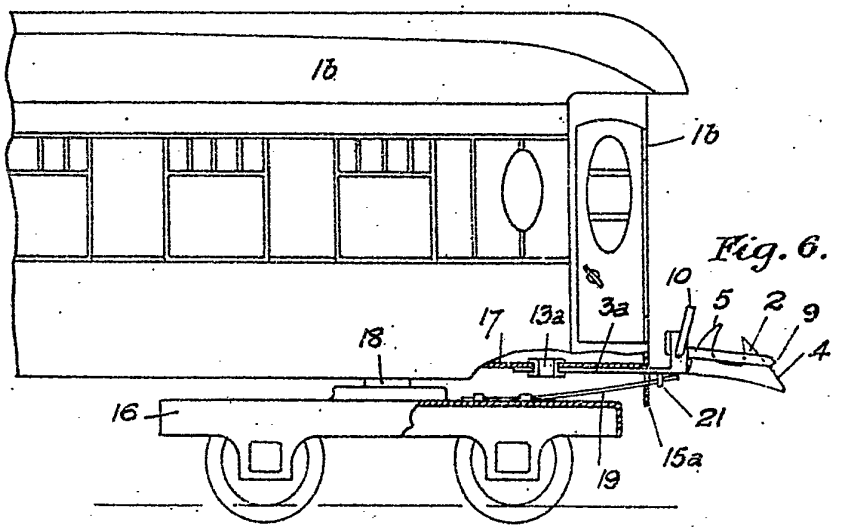


Fig. 6.

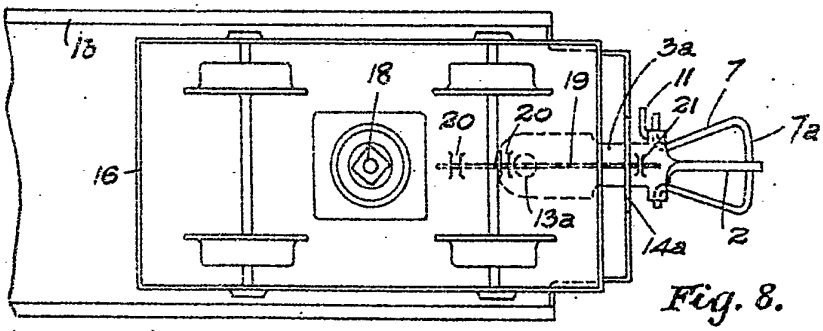
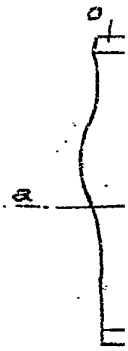


Fig. 8.



7. 3.

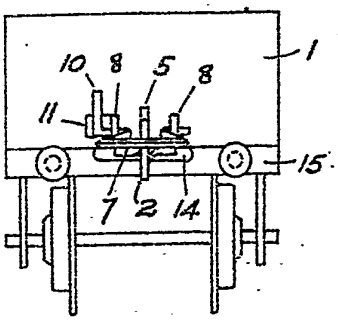


Fig. 2.

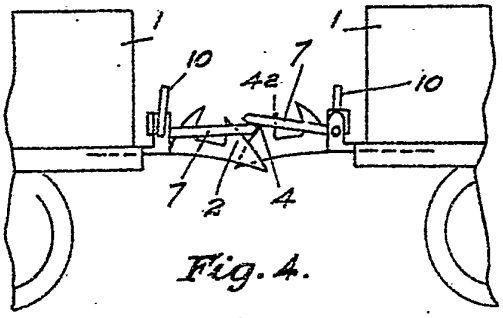
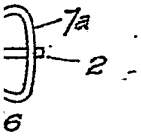


Fig. 4.



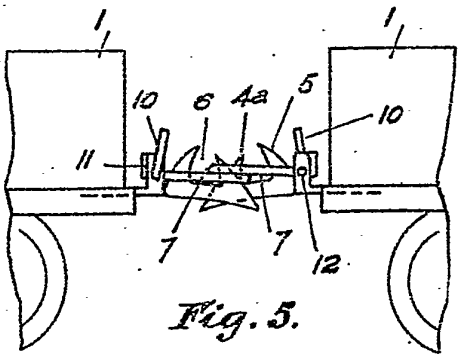


Fig. 5.

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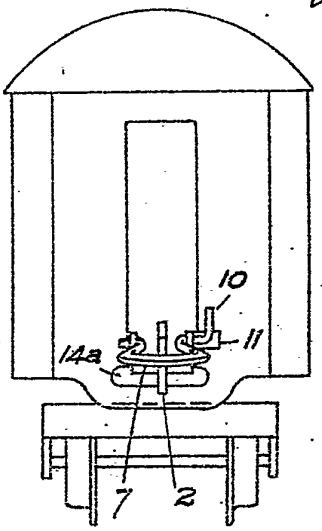

Fig. 7.

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7. 8.

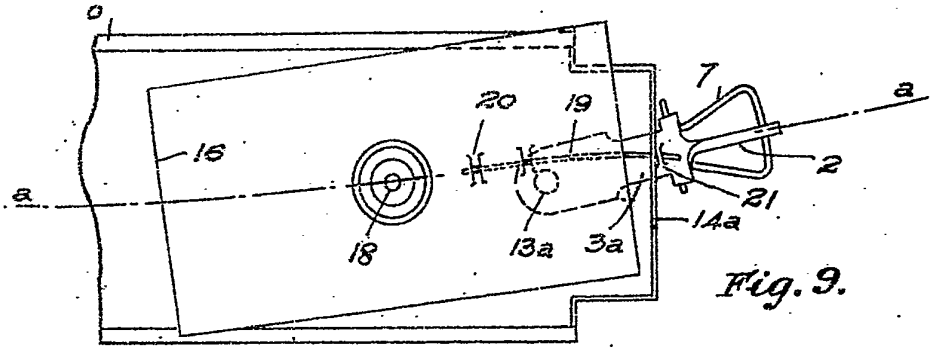


Fig. 9.

Charles & Read Ltd. Photo Litho.

[This Drawing is a reproduction of the Original on a reduced scale.]

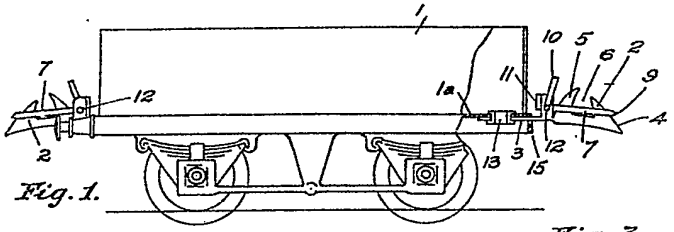


Fig. 1.

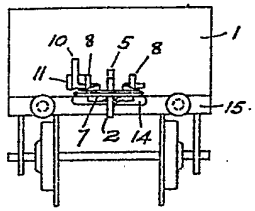


Fig. 2.

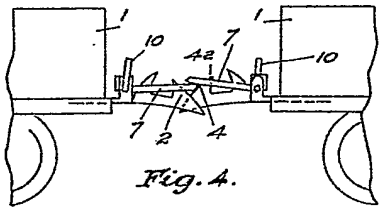


Fig. 4.

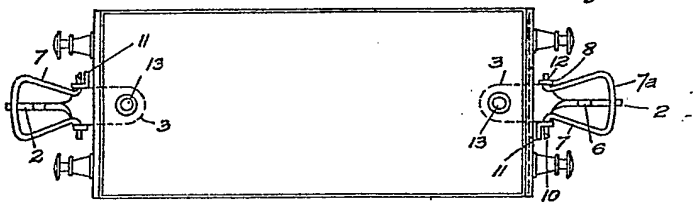


Fig. 3.

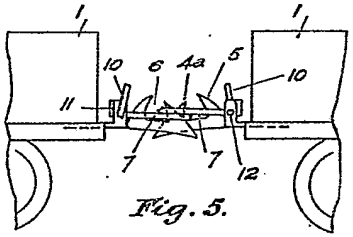
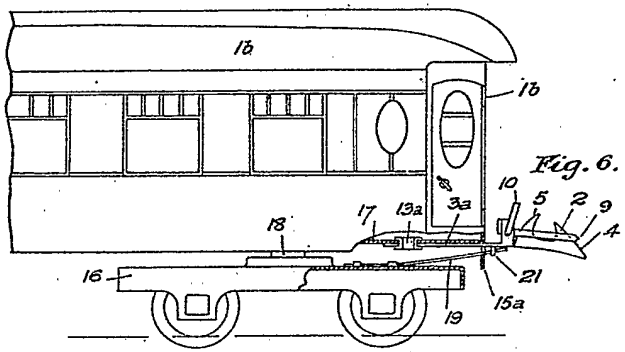


Fig. 5.



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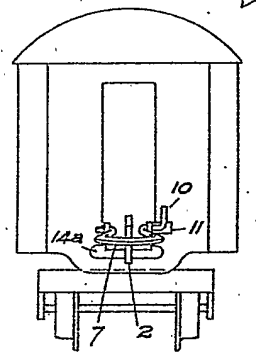


Fig. 7.

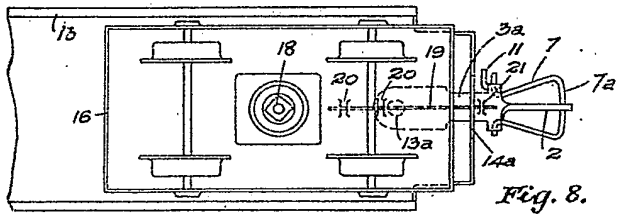
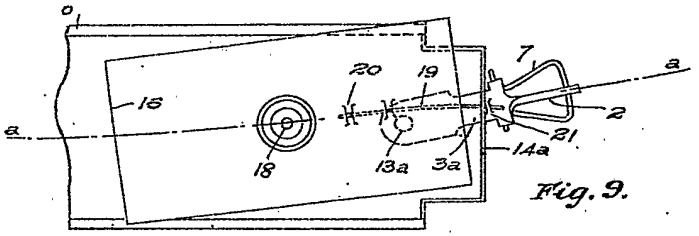


Fig. 8.



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