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G. W. GROSSMITH ET AL

2,374,009

WAGON TIPLER

Filed Feb. 18, 1943

3 Sheets-Sheet 1

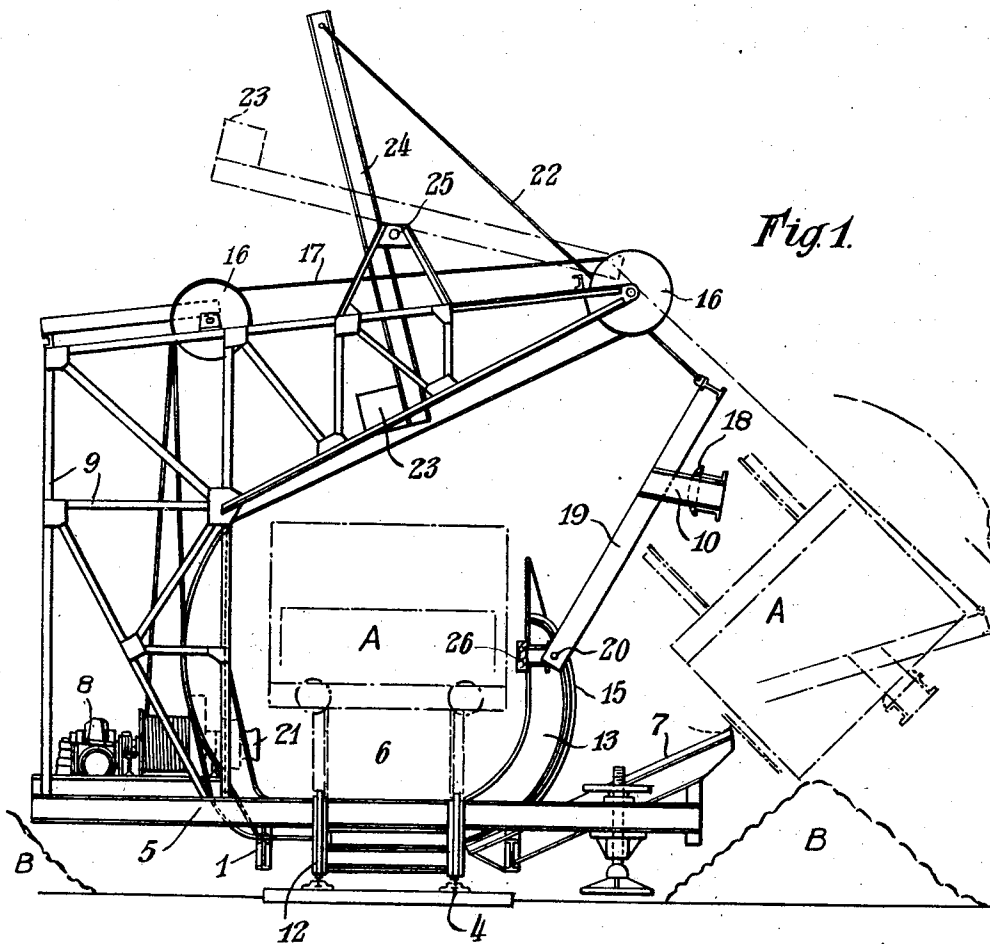


Fig. 1.

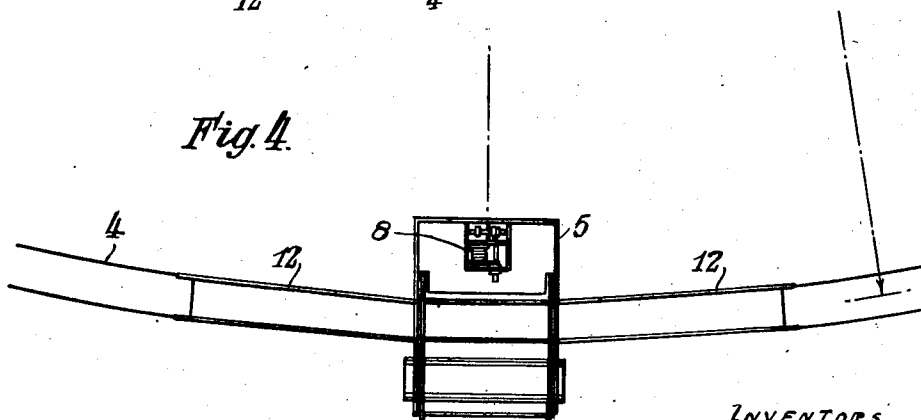


Fig. 4.

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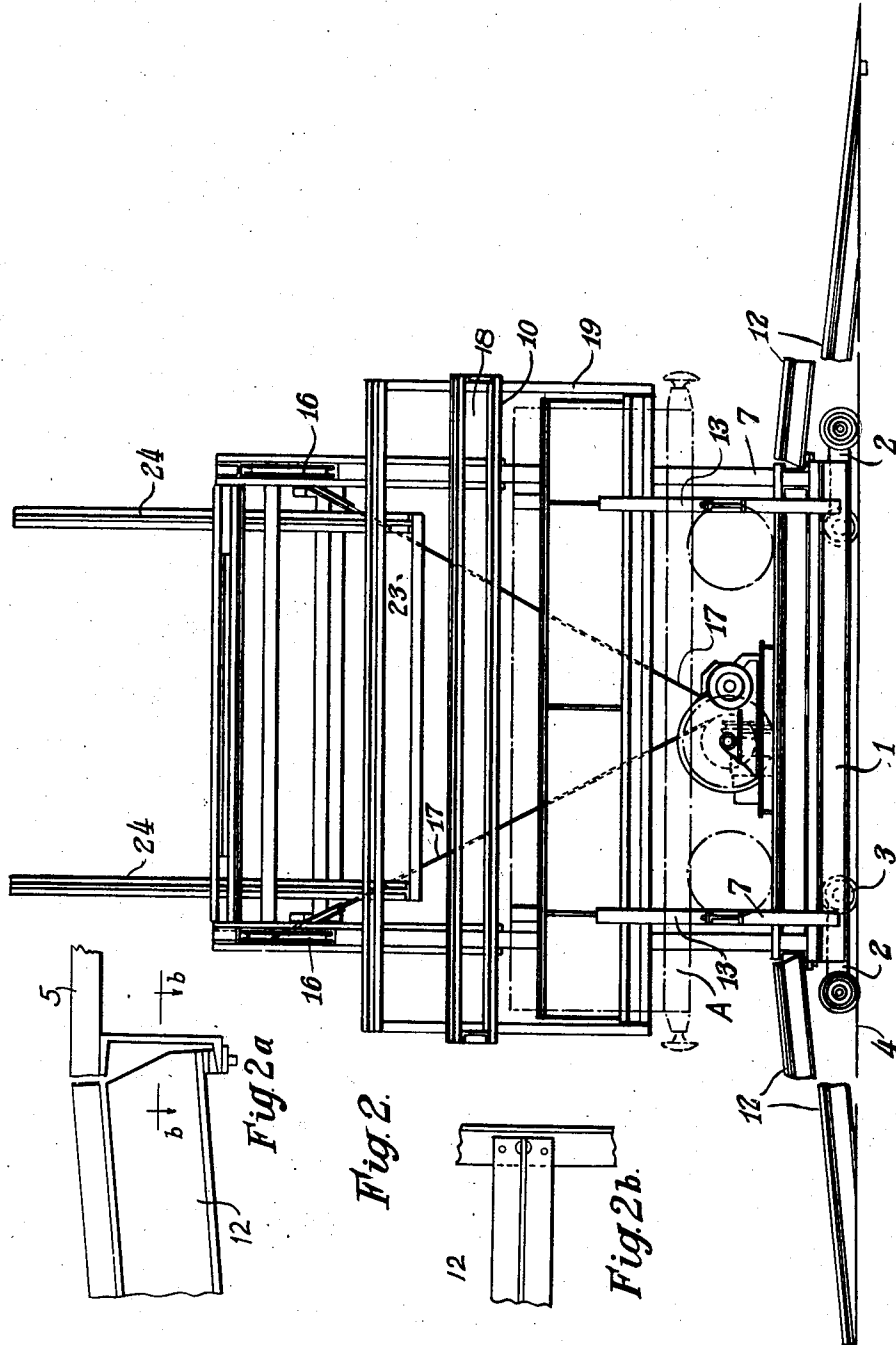
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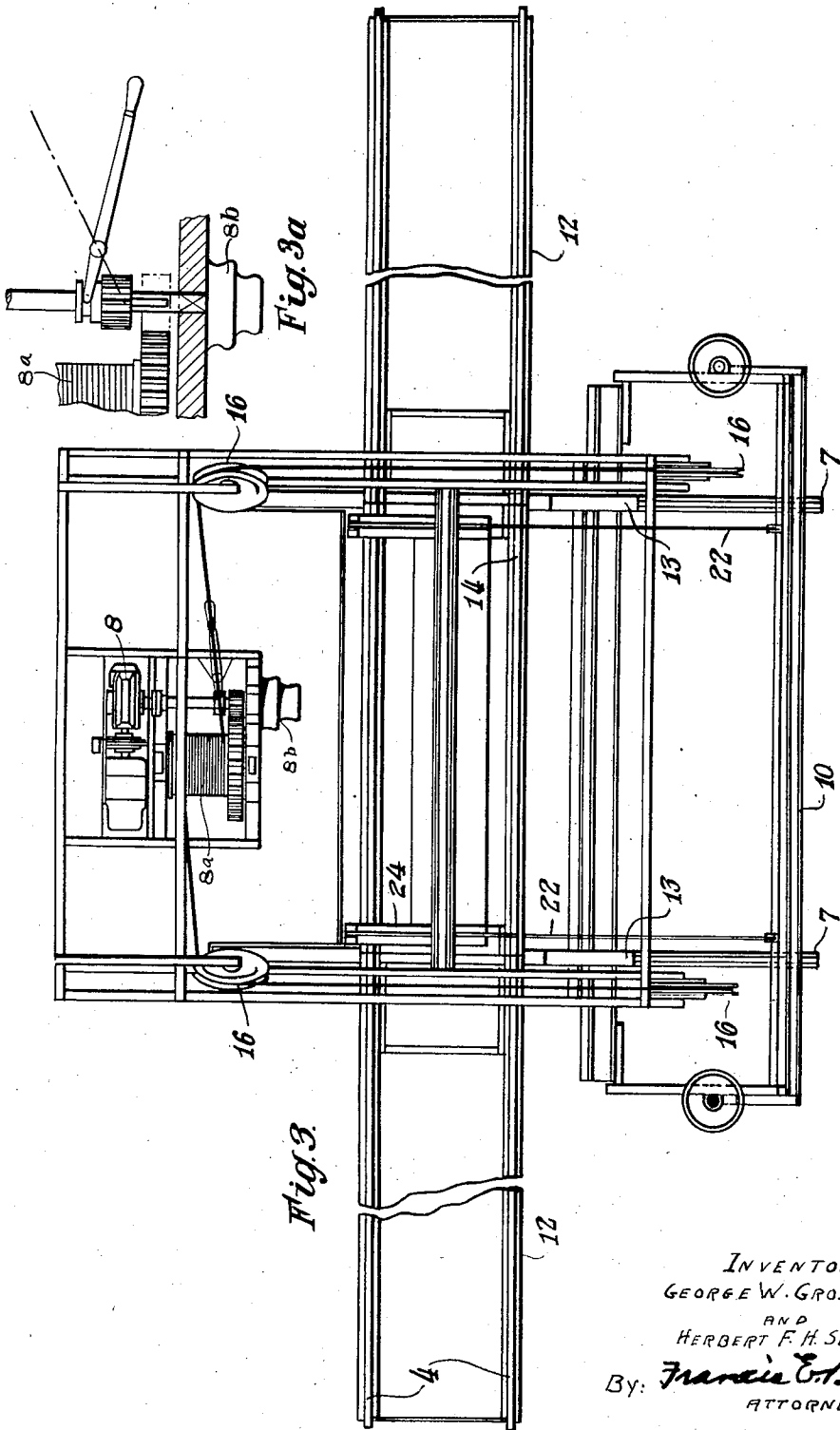
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WAGON TIPPLER

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,374,009

WAGON TIPPLER

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3 Claims. (Cl. 214—51)

This application is a continuation in part of our contemporaneously pending application Serial No. 475,421, now Patent #2,344,742 and the invention relates to wagon tipplers such as are employed for emptying railway wagons and the like and especially to wagon tipplers in which the wagon is supported by a rotatable cradle and retained in place during the action of tipping by lateral and top stops, although the invention is not specifically limited to this particular form of wagon tippler.

Hitherto the scope of wagon tipplers has been limited owing to the fact that such apparatus has been immobile, necessitating its being located in a fixed position. Consequently, in some cases two or more wagon tipplers have been erected in fixed separated positions for serving two or more receiving hoppers, though the total capacity has been no more than could have been handled by one tippler.

The object of the present invention is to provide a form of tippler which is mobile and which can empty or discharge wagons by side tipping, at any point on either side of a railway line.

According to the invention a wagon tippler and actuating gear therefor is mounted upon a supporting mobile carriage, said carriage embodying means for guiding a railway wagon into and out of said tippler and means determining the operative path of said tippler whereby the wagon supported therein will discharge its contents laterally to the line of travel of said carriage.

In a preferred form the carriage is mounted on wheels or bogies designed to run on the same rails as those on which run the wagons to be tipped, the wheels or bogies being articulated in respect to the carriage so as to permit the tippler to travel along curved railway tracks.

In an alternative construction the carriage is provided with an endless track or road wheels.

The railway wagons are guided into and out of the tippler by means of inclined railed ramps, up which on the incoming end, the full wagons are hauled by means provided on the tippler, and down which, on the outgoing end, the empty wagons run by gravity after being ejected from the tippler by the impact of the full incoming wagon. The ramps are connected to the carriage by hinges, to enable them to conform to curved and irregular railway tracks.

The carriage is provided with inclined lateral roller paths upon which the tipping cradle is caused to roll for discharging the contents of the wagon, lateral and top stops being provided

in the usual manner to retain the wagon securely in the cradle during partial inversion.

In order that the invention may be clearly understood, reference is directed to the accompanying drawings wherein:

Figure 1 is an end elevation of one form of tippler constructed in accordance with the present invention.

Figure 2 is a side elevation of Figure 1.

Fig. 2^a is a fragmentary elevation on an enlarged scale.

Fig. 2^b is a fragmentary sectional plan on the line *b-b* of Fig. 2^a showing the articulated connection between the ramp 12 and frame 5.

Figure 3 is a plan of Fig. 2 and Fig. 3^a is a fragmentary plan on an enlarged scale of the clutch mechanism.

Figure 4 indicates diagrammatically the use of a tippler operating on a curved rail track.

Referring to the drawings which illustrate one form of tippler made in accordance with the present invention comprising an undercarriage 1 mounted on a pair of bogies 2, 2, the flanged wheels 3 of which are adapted to run on a standard gauge railway line 4. The undercarriage 1 supports a main frame 5 upon which is erected the tippler mechanism which comprises generally a cradle to receive a wagon, a lateral or transverse rail track 7 determining the path of the tippler when discharging and return, a winch 8 for controlling the movement of said cradle having a winding drum 8^a and a capstan drum 8^b. Also on the undercarriage 1 is a super structure 9.

In order that the capstan drum 8^b may be used without rotating the tippler rope, a sliding pinion or clutch (not shown) is incorporated in the train of gears which drives the winding drum 8^a so that the capstan drum 8^b may be driven independently of the winding drum 8^a which is provided with brake means (not shown) for retaining it in the desired position whilst disconnected from the driving unit.

The operating winch may be driven by any type of prime mover such as an electric motor, steam engine or internal combustion engine.

A wagon top support 10 pivoted to the cradle 6 serves to hold a wagon A in place when the cradle is rocked to discharge the contents of a wagon carried therein, the wagons being moved in turn into and out of the cradle 6 by means of ramps 12 at each end of the tippler. The cradle 6 on which the wagons are held in turn consists of a pair of partly encircling members spaced apart and forming cradle ends 13, 13, a

length of railway track 14 on which the wagon is adapted to be run forming part of the cradle 6 and movable therewith as a section which is aligned with the ramps 12 when the cradle is at its normal or receiving position as illustrated in Figure 1, suitable guard rails and stops being provided where necessary. The cradle ends 13 are provided on their underside with arc-shaped surfaces 15 adapted to roll on the lateral rail tracks 7 which consist of a pair of short fixed transverse rail tracks extending to one side outwardly and slightly upwardly inclined one at each end of the main frame 5 and adapted to support the cradle 6 in which the wagons are held during the tipping motion.

Mounted on the main frame on the side away from the lateral track 7 is the lifting and turning mechanism comprising a lattice gantry-like superstructure 9 extending over the cradle 6 and provided with convenient pulleys 16, 16 for actuating ropes 17, 17, which are secured to the cradle ends 13 and to the winding drum 8^a of the winch 8 conveniently mounted on the main frame 5. The ropes 17, 17, may be positioned in guides on the cradle ends in the conventional manner so that the pull of the rope is always tangential thereto thereby producing the rolling action of the cradle ends 13 on the lateral rail tracks 7 as the ropes 17, 17 are hauled on to tip the wagon.

To retain a wagon firmly on the cradle 6 whilst being tipped a top sustaining beam 18 is provided which in the example illustrated takes the form of a padded beam extending a length greater than the longest wagon that can be accommodated on the tippler, the said beam 18 being carried on arms 19, 19, pivotally attached to the cradle as at 20. When the cradle 6 is positioned so that the wagon is upright, the top sustaining beam 18 is held clear of the highest wagon to be accommodated. In order that upon rotation of the cradle 6 the top sustaining beam 18 is operated to contact the top of a wagon and hold it securely on the rails of the cradle, operating ropes 22 are provided and attached to the arms 19 carrying the top sustaining beam 18, so that as the tippler is operated the top sustaining beam is held firmly against the top of the wagon according to the position of the cradle 6. The required tension in the ropes 22 is provided by a balance weight 23 carried at one end of secondary arms 24, 24, to the other ends of which the ropes 22 are secured. The secondary arms 24, 24, are pivoted to the superstructure 9 as at 25 and rise and fall to correspond with the movements of the cradle 6, the ropes 22 being passed over suitably located pulleys if necessary. The tension of the ropes 22 operating the top sustaining beam may also serve to check any tendency for the cradle to over-run its final tipping position.

The ramps 12 enable a railway wagon to be transferred from the railway line 4 on which the tippler is positioned to and from the track section 14 of the cradle 6 which lies between the cradle ends. The ramps 12 are provided preferably at both ends of the main frame so that a wagon which has already been emptied can be run out of the tippler without interfering with the transfer to the tippler of the next wagon to be emptied. The ramps 12 consist of short rail-like girders suitably braced and hingedly secured to the main frame so as to be movable about a vertical and horizontal axis sufficient to enable the ends of the said ramps to be engaged with the railway line 4 irrespective of any change in

gradient, curve or tilt of that part of the track on which the tippler may be located. The end of the ramps would be tapered and may be channel-shaped to overlie the railway line and provide lateral positioning means. When the tippler has been run into position jacks, packing blocks, or other adjustable devices 25 may be brought into use to steady and support the main frame 5 as the tippler is being employed.

The operation of the tippler is as follows:

The tippler is brought to the position where it is desired to be operated and, if necessary, brakes are applied or chocks placed under the wheels to guard against movement along the track and the jacks brought into use if necessary. It should be noted that the tippler can be towed into position by external means such as a locomotive or under its own power by using a suitable rope and some convenient bollard from which to obtain a purchase. A rope is now attached to the first wagon to be tipped and passed around a capstan drum 8^b incorporated in the winch mechanism which is then operated to draw the wagon up the ramp onto the track section 14 in the cradle. The winding drum 8^a being held stationary during this operation the hoisting rope having been disengaged from the capstan drum 8^b the winding drum 8^a is now set in motion to tip the wagon by rolling the cradle ends 13 on the lateral tracks 7 resulting, shortly after the rolling motion has commenced, in the top sustaining beam 18 being brought into contact with the top of the wagon to hold it pressed firmly onto the track section 14. When the wagon has been tipped and emptied the winch is reversed and the cradle lowered to its initial position, whereon the wagon can be run down the other ramp onto the rail from which it was transferred to the cradle and the operation repeated with the next wagon. The tippler may, if desired, be moved to a new position for each wagon load tipped so that with a tippler made in accordance with the present invention it is possible to form a bank alongside but clear of the railway line as indicated at B, Figure 1. The bank may be formed on either side by turning the tippler round which may be done on a triangular siding or turntable, or a turntable may be incorporated in the tippler. All movements of the tippler can be effected by means of the capstan drum 8^b thus making the tippler independent of any external source of power.

In a modified arrangement suitable for sites intended to be permanent, one or more additional rails may be provided parallel to the track on which the wagons run to provide increased stability at right angles to the track and to relieve said track of part or the whole of the load of the tippler. Such an arrangement by providing additional stability may dispense with the need for jacks.

What we claim and desire to secure by Letters Patent is:

1. A mobile wagon tippler including a carriage mounted on wheels engaged only with and remaining in engagement with the same track as the wagon to be tipped, a main frame mounted on the carriage and extending across the same and projecting from opposite sides thereof and provided at one side with a superstructure having a top portion located above and extending transversely of the carriage and projecting to a point beyond the same, transversely disposed outwardly extending upwardly inclined tracks rigid with the main frame and located at the other side there-

of, side discharge tippler mechanism comprising a cradle located on the main frame and having its bottom portion adjacent the lower end of the inclined tracks and having a track section located above the carriage and arranged to receive a wagon to be emptied, said cradle comprising curved members arranged to roll on the inclined tracks to carry a wagon from an upright position to a dumping position, and means extending from the top portion of the superstructure and operatively connected with the cradle for moving the same to the dumping position thereof.

2. A mobile wagon tippler including a carriage mounted on wheels engaged only with and remaining in engagement with the same track as the wagon to be tipped, a main frame mounted on the carriage and extending across the same and projecting from opposite sides thereof and provided at one side with a superstructure having a top portion located above and extending transversely of the carriage and projecting to a point beyond the same, transversely disposed outwardly extending upwardly inclined tracks rigid with the main frame and located at the other side thereof, said discharge tippler mechanism comprising a cradle located on the main frame and having its bottom portion adjacent the lower end of the inclined tracks and having a track section located above the carriage and arranged to receive a wagon to be emptied, said cradle comprising curved members arranged to roll on the inclined tracks to carry a wagon from an upright position to a dumping position, a power unit on said main frame having means extending from the top portion of the superstructure and operatively connected with the cradle for moving the same to the dumping position thereof, means for dis-

connecting said power unit from said tippler mechanism, and means for employing said power unit to effect transfer of wagons to and from said tippler mechanism.

5 3. A mobile wagon tippler including a carriage mounted on wheels engaged only with and remaining in engagement with the same track as the wagon to be tipped, a main frame mounted on the carriage and extending across the same and projecting from opposite sides thereof and provided at one side with a superstructure having a top portion located above and extending transversely of the carriage and projecting to a point beyond the same, transversely disposed outwardly extending upwardly inclined tracks rigid with the main frame and located at the other side thereof, side discharge tippler mechanism comprising a cradle located on the main frame and having its bottom portion adjacent the lower end of the inclined tracks and having a track section located above the carriage and arranged to receive a wagon to be emptied, said cradle comprising curved members arranged to roll on the inclined tracks to carry a wagon from an upright position to a dumping position, means extending from the top portion of the superstructure and operatively connected with the cradle for moving the same to the dumping position thereof, arms pivotally supported by said cradle, a top sustaining bar mounted on said arms and arranged to engage the top of a wagon being dumped, and a pendulum weighted lever mounted on the superstructure and operatively connected with the top sustaining bar.

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