April 26, 1960 D. L. CROSMAN 2,933,854

TOY ACCESSORY AND OPERATING MEANS THEREFOR

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Fig. 1.

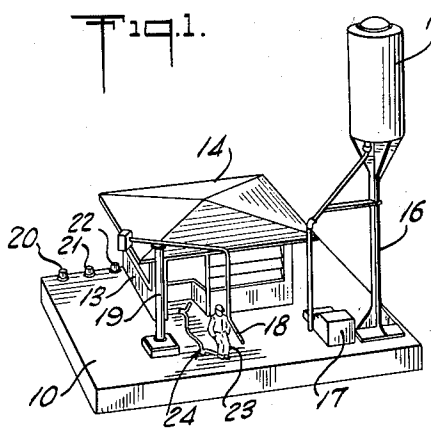


Fig. 5.

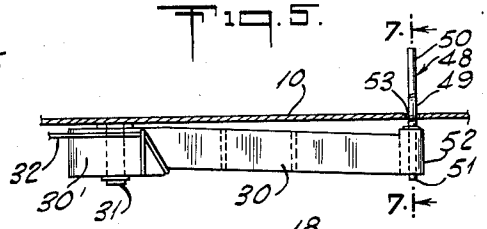


Fig. 6.

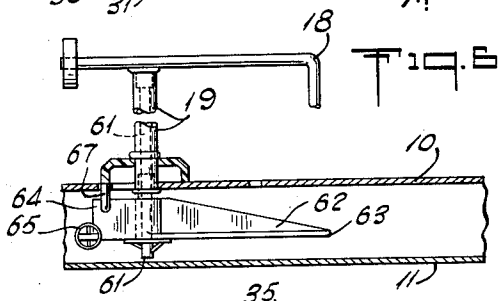


Fig. 4.

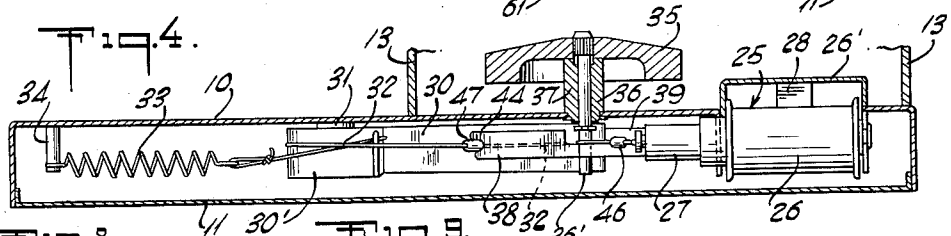


Fig. 8.

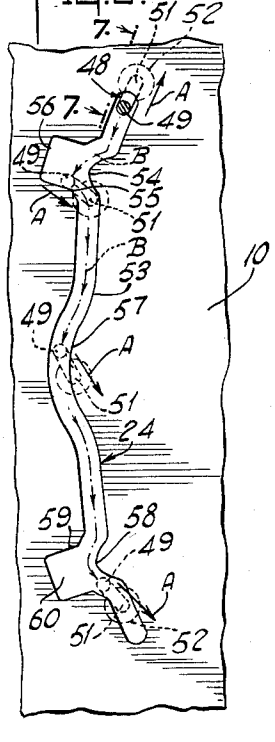


Fig. 9.

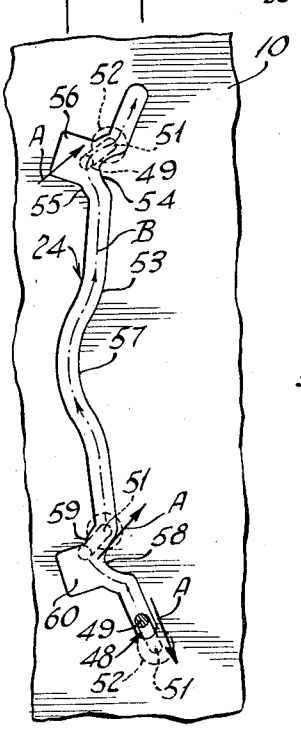
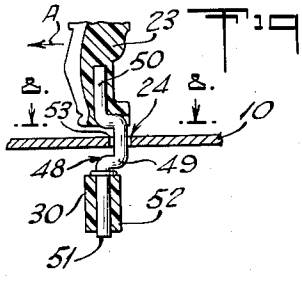


Fig. 7.



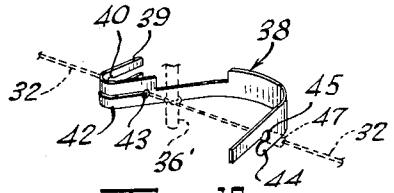


Fig. 10.

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Fig. 2.

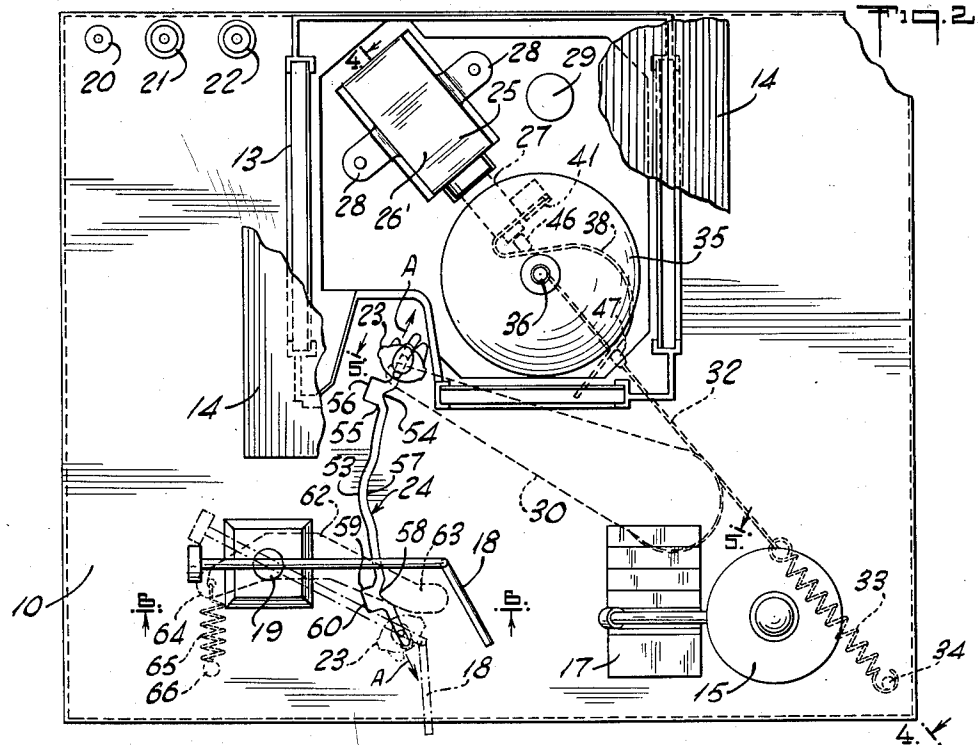
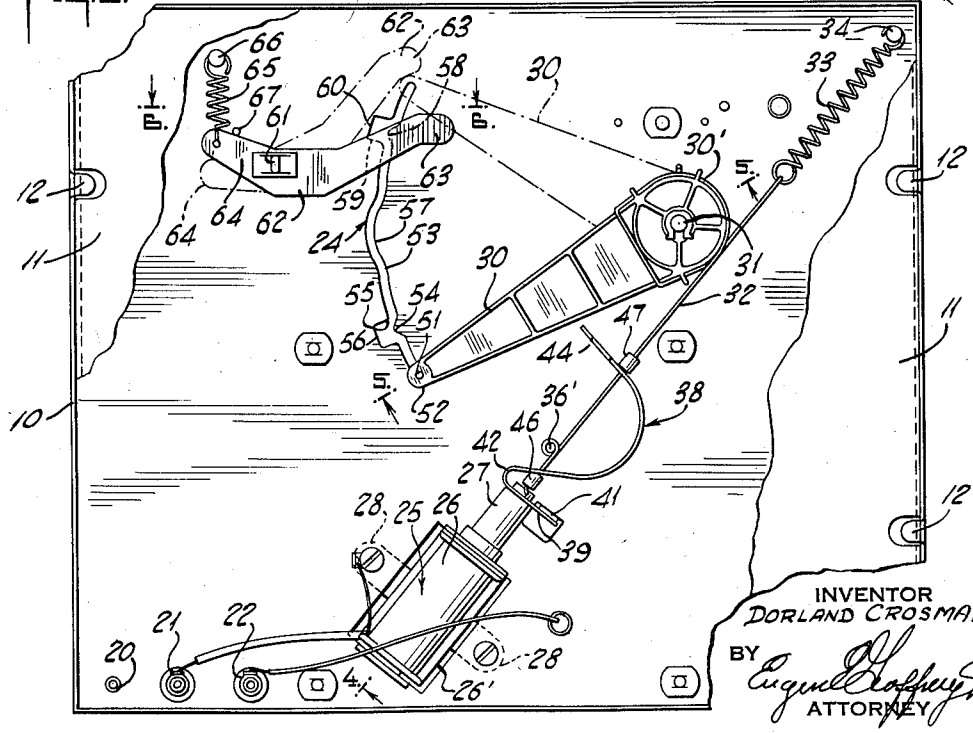


Fig. 3.



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TOY ACCESSORY AND OPERATING MEANS THEREFOR

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Application November 14, 1956, Serial No. 622,179

8 Claims. (Cl. 46—245)

This invention relates to an improved toy and operating means therefor that may be used among other things for simulating the loading of a vehicle with a liquid fuel.

One object of the invention resides in the provision of an improved fuel loading station for use with toy railroads and other similar equipment to simulate the loading of fuel into the locomotive. It also includes an improved operating mechanism for moving a toy figure to simulate the movement of a man from an enclosure to the track side for applying the simulated fuel hose to the locomotive or other vehicle and then returning the figure to the enclosure.

Still another object of the invention resides in the novel and improved lever operating mechanism that is characterized by its simplicity, dependability and low cost. Through a novel and improved arrangement of elements the rate of movement of the lever is simply and effectively controlled to attain a wide range of angular velocities and without affecting other elements of the mechanism.

Still another object of the invention is the provision of a novel and improved fuel station for model railroads and other similar devices and including a movable toy figure and fuel line that are moved toward and away from the vehicle to simulate the action of a real person. By reason of an improved control mechanism a high degree of play value is attained and the accessory can be controlled from a remote location.

A further object of the invention resides in an improved structure for supporting and transporting a toy figure first in one direction and then in another and automatically reversing the figure at the start of its travel in each direction to simulate the movement of an actual person.

A still further object of the invention resides in a novel and improved fuel loading station for model railroads and other similar equipment.

The above and other objects of the invention will become more apparent from the following description and accompanying drawings forming part of this application.

In the drawings:

Fig. 1 is a perspective view of one embodiment of the invention;

Fig. 2 is a top view of the invention as shown in Fig. 1 with parts broken away to illustrate portions of the operating mechanism;

Fig. 3 is a bottom view of the invention as shown in Fig. 3;

Fig. 4 is a cross sectional view taken along the line 4—4 of Figs. 2 and 3 to illustrate certain structural details of the operating mechanism;

Fig. 5 is a cross sectional view taken along the lines 5—5 of Figs. 2 and 3;

Fig. 6 is a cross sectional view of Figs. 2 and 3 taken along the lines 6—6 thereof;

Fig. 7 is a cross sectional view of supporting and transporting means for a toy figure taken along the lines 7—7 of Figs. 5 and 8;

Figs. 8 and 9 are top views of the cam slot which cooperates with the toy figure supporting and transporting means for automatically reversing the direction of the figure as it is moved first in one direction and then the other; and

Fig. 10 is a perspective view of a flat spring forming part of the toy figure operating mechanism and speed control means associated therewith.

For the purposes of this application the invention will be described in connection with a fuel oil station for use as a track side accessory with model railroad equipment though it is to be understood that certain features of this invention may be used in other types of toys and devices.

Referring now to the drawings and more specifically to Fig. 1 the track side accessory includes a base 10 preferably provided with a bottom cover member 11 secured thereto by suitable lugs 12. The top of the base 10 carries a simulated enclosure or house 13, a roof 14, a simulated sand tank 15 supported by a stanchion 16, a platform 17 to facilitate the loading of sand into a locomotive as in the case of actual equipment and a fuel pipe 18 supported by a post 19 for delivering fuel to a Diesel locomotive. The fuel pipe 18 is pivotally supported on the post 19 and is oscillated by an electrical control mechanism when actuated through the application of energy to the terminals 20 and 21. In addition to the foregoing elements the station further includes a toy figure 23 that moves back and forth in a cam slot 24 in the base 10 when energy is applied to the device. The movements of the toy figure 23 and the fuel pipe 18 are coordinated so as to simulate the action of a real person leaving the house 13, applying fuel to the locomotive and then returning to the house or station.

The operating apparatus for the toy figure 23 and fuel pipe 18 is shown in Figs. 2 through 10. Primary motive power is supplied by a plunger type magnet generally denoted by the numeral 25 and comprising a coil 26 and a plunger 27. The coil 26 is mounted on the base by a U-shaped bracket member 26' having said ears 28 screwed or otherwise fastened to the base. The leads of the coil are connected to the ground post 20 and the insulated terminal 21 to which energy is applied for operation of the accessory. In order to illuminate the inside of the station 13 a bulb and socket assembly 29 is provided within the station and one side of the socket is connected to the base 10 (grand terminal 20) and the other side to terminal 22 so that the station may be illuminated independently of the operation of the toy figure 23 and fuel pipe 18.

The supporting and transporting means for the toy figure 23 includes a lever 30 pivoted to the underside of the base at 31. Rotation of the lever 30 is accomplished by a cord or cable 32 connected effectively at one end to the plunger 27, encircling the hub 30' of the lever 30 and connected to a spring 33 having one end fixed to a post 34 secured to the base 10. The spring 33 functions to keep the cable 32 taut and moves the lever 30 to the full line position as shown in Figs. 2 and 3 when the coil 26 is denergized. When the coil is energized by the application of a suitable voltage to the terminals 20 and 21 the plunger 27 is pulled inwardly of the coil 26 and causes the lever 30 to be moved to the position as indicated in dotted outline in Figs. 2 and 3.

In order to limit the rate of angular displacement of the lever 30 upon application of energy to the coil 26 an inertia wheel 35 is directly coupled to the cable 32. More specifically, the inertia wheel 35 is carried by a shaft 36 pivotally supported by a bearing 37 secured to the base 10 (see Fig. 4). The bottom end 36' of the shaft 36 extends beyond the cable 32 and the latter is wrapped about the shaft 36' to provide at least one full

turn. In order to enable the inertia wheel to effectively reduce the speed of operation of the plunger magnet it has been found desirable to maintain the cable 32 in tight coupling with the inertia wheel shaft 36 at all times so that control of the motion of the lever 30 will be effected throughout its entire movement. For this purpose a leaf spring 38 is provided for maintaining cable in tight engagement with the shaft 36 and at the same time providing a simple and effective structure for the attachment of the cable to the plunger 27. While under certain conditions the spring 33 may provide adequate tension on the cable 32, in instances where a relatively light spring 33 may be required to obtain the desired mode of operation of the lever 30 a relatively heavy spring 38 may nevertheless be provided for insuring proper operation of the inertia wheel without affecting the characteristics of the operating mechanism. Moreover the use of the spring 38 enables substantial tension to be obtained about the shaft 36 without the need for enlarging the size of the magnet coil 26 or in any way affecting the operation of spring 33.

The spring 38 is shown more clearly in Figs. 3 and 10 and is generally in the form of an 'S.' One end 39 of the spring is provided with a bifurcation extending beyond the bend 42. The end portion 39 further includes a circular opening 40 intersecting the bifurcation as may be observed in Fig. 10 for attachment of the spring to a cooperating groove formed in the outer end of the plunger 27. The end portion 39 of the spring 38, in addition to forming an attachment to the plunger 27, also cooperates with a stop 41 secured to the base 10 to limit the outer movement of the plunger 27.

The bifurcation of the end 39 of the spring 38 is terminated beyond the curved portion 42 in a circular opening 43 substantially in line with the circular opening 40 previously described. The spring is then curved back beyond itself and the outer end 44 also includes a bifurcation terminating in a circular opening 45. It will be observed that the spring 38 is made large enough to span the shaft position 36 so that it will not interfere with the operation of the apparatus upon reciprocation of the plunger 27. The cable 32 is fastened to the spring 38 in this embodiment of the invention by split lead shot 46 and 47. The shot 46 is secured to the end of the cable 32 and engages the spring 38 with the cable passing through the opening 43. The split lead shot 47 is positioned on the cable 32 so that when it engages the outer end 44 of the spring 38 it will hold the spring in a compressed position and thereby maintain the cable part between the shot members 46 and 47 in a taut condition. This will cause the cable to firmly engage the shaft 36 so that any motion of the plunger 27 will impart equivalent rotation to the inertia wheel 35. It will be observed from the foregoing description that the stiffness of the spring 38 has no effect upon the power required on the part of the plunger magnet 25 to move the lever 30 in a clockwise motion as viewed in Fig. 3 and any motion of the cable will be controlled by the inertia wheel 35.

The toy figure 23 previously described is actually carried and transported by the outer end of the lever 30. More specifically, the toy figure 23 is supported by a pivoting arm 48 having a central offset portion 49. The upper end 50 of the pivoting arm 48 is secured to the toy figure with the offset portion 49 extending to the rear thereof. For convenience the front of the fragmentary section of the toy figure 23 in Fig. 7 is denoted by the arrow A. The bottom portion 51 of the pivoting arm 48 pivotally engages the outer end 52 of the lever 30 with the offset portion 49 engaging the walls of the slot 53. The pivoting arm 48 extends through a cam slot 53 in the base 10 and the slot is provided with a radius substantially equivalent to the radius of the arm 30 though it may deviate from the radius of the arm 30 by an amount not exceeding the depth of the offset portion 49 of the pivoting arm. The cooperation of the slot 53 with the pivoting arm 48 as the lever 30 is moved first in one direction and then the other is shown in Figs. 8 and 9 and will be described in connection with those figures.

Referring first to Fig. 8 which represents the motion of the toy figure outwardly from the station 13 it will be observed that the offset portion 49 is downwardly as viewed in Fig. 8 and the toy figure is therefore facing in the direction of the arrow A. As the lever 30 is moved from the solid line position as shown in Fig. 3 to the dotted position the toy figure will be carried downwardly as illustrated in Fig. 8 until the offset portion 49 strikes the cam 54 of the slot 53. The offset portion 49 will be caused to rotate in the direction of the dotted arrow B until it strikes the edge 55 of the cut out 56 also forming part of the slot 53. As the lever 30 moves beyond this point it will then carry the offset portion 49 in a trailing position so that the toy figure will now face in the direction of movement indicated by the dotted arrows B. When the lever arrives at a position centrally of the slot 53 and defined by the curved section 57 the toy figure will be caused to simulate slight shift in direction and will tend to face slightly to the right as shown in this figure. As the lever 30 passes this curved section the toy figure will again straighten out and will be carried in the forward position past the cam part 58 of the slot 53 until it reaches the end or outer position. The outer position of the toy figure is shown in Fig. 1.

When the plunger magnet 25 is deenergized the spring 33 will carry the lever 30 from the dotted line position of Fig. 3 to the solid line position and in so doing the toy figure 23 will be moved back to the station 13. This action is illustrated in Fig. 9. It will be observed that the full line position of the offset portion 49 of the pivoting lever 48 is in the lowermost end of the slot 53 in Fig. 9. As the lever moves backwardly the offset portion 49 is in the leading position and will strike the cam part 58 deflecting it to the left until it strikes the edge 59 of the cutout 60. In so doing the offset portion 49 will be moved to the trailing position so that the toy figure will now face in the direction of arrow A and move toward the station. As the lever carries the toy figure past the curved section 57 the toy figure will face slightly to the left as shown in Fig. 9, then again be straightened out and carried in a forward direction past the cam part 54 and into the station 13.

In order to coordinate the operation of the fuel pipe 18 with the motion of the toy figure, the fuel pipe is mounted on a shaft 61 extending through the post 19 and into the base 10. The bottom end of the shaft 61 carried a lever 62. One arm 63 of this lever projects beyond the slot 53 as shown in Figs. 2 and 3 and a second arm 64 projects in the opposite direction. A spring 65 is connected between the arm 64 of the lever 62 and a post 66 fastened to the base 10 to hold the lever in its clockwise position as viewed in Fig. 3. At the same time the fuel pipe 18 is disposed in a rearward position as shown in Fig. 2. With this arrangement as the lever 30 is moved from its solid line position as shown in Fig. 3 to the outermost position of the slot 53 it will engage the lever arm 63 and displace it from the full line position shown in Fig. 3 to the dotted line position. This angular movement of the lever 62 functions to rotate the fuel pipe 18 about the post 19 and brings it to the outermost position as shown in Fig. 1 simultaneously with the arrival of the toy figure so that the apparatus simulates the action of a real person coming out of the station 13 and moving the fuel pipe 18 to load fuel into a locomotive or other vehicle.

With the invention as described it is evident that a high degree of realism and play value are attained and at the same time the attainment of these ends is accomplished by a simple dependable and effective structure at relatively low cost. In addition added realism is obtained

through the cooperating motions of the toy figure and fuel pipe which are governed in speed so that displacement of the toy figure is not instantaneous but more nearly simulates actual performance of a real person. While the operating mechanism in the instant embodiment of the invention is for the purpose of operating a toy figure and rotating a fuel pipe the structure may of course be applied for other purposes requiring controlled rotary motion with the motive means being in the form of a plunger magnet.

While only one embodiment of the invention has been illustrated and described, it is apparent that other modifications, alterations and changes may be made without departing from the true scope and spirit of the invention as set forth in the appended claims.

What is claimed is:

1. In a toy accessory, a toy figure, a base member including an elongated cam slot therein, toy figure supporting means extending through said slot and having an offset portion engageable with and cooperating with the edges of said slot, said figure being confined by said slot for movement therealong, a pivoted lever including a hubbed portion symmetrical with the pivotal location, said lever pivotally carrying said supporting means, resilient means connected to said base, a plunger magnet, a cable connected to said plunger magnet looped around the hubbed portion of said lever and connected to said resilient means whereby said lever is moved in one direction by said cable in response to operation of said magnet and in the other direction in response to said resilient means, and an inertia wheel engaging said cable to control the movement of said lever.

2. In a toy accessory according to claim 1 wherein said inertia wheel includes a shaft about which said wheel is rotatable, said cable is wrapped about said shaft and spring means engages said cable on each side of said shaft to tightly couple the cable to said shaft without affecting the cable tension reacting against the operation of said magnet.

3. In a toy accessory according to claim 1 including an accessory mounted on a rotatable shaft, a second lever for angularly moving said shaft and extending into the path of said pivoted lever, said pivoted lever engaging and displacing said second lever with movement in one direction and spring means for returning said second lever to the first position upon movement of the pivoted lever in the other direction.

4. A toy accessory comprising a base member having an elongated slot defined thereon, a member having one end rotatably mounted on said base member and the other end oscillatable back and forth along a path adjacent to said slot, mannikin means pivotally connected to said member and having a portion extending upward through said slot in said base member, and means to oscillate said member whereby to move said mannikin means along said slot.

5. A toy accessory according to claim 4, wherein said mannikin means includes a crank arm pivotally connected to said member and said slot includes a main elongated slot portion, an offset slot portion extending laterally from said main slot portion, and means in said main slot portion to deflect said mannikin means against a wall of said offset portion to restrain said mannikin means against movement along said slot and to cause rotation of said crank arm and turning of said mannikin means before said mannikin means comes out of said offset portion and continues along the main elongated slot portion.

6. A toy according to claim 5, wherein said means in said slot includes a protuberance defined in said base member extending outwardly from one side of said slot at a location opposite said laterally extending offset slot portion whereby said mannikin means striking said protuberance is deflected thereby into said offset portion.

7. An accessory according to claim 4, wherein said mannikin means includes a crank arm pivotally mounted on said member and having a portion thereof extending upwardly through said slot in said base member and having a mannikin mounted on said crank arm.

8. A toy accessory according to claim 4 wherein said member includes a hubbed portion and including a tension spring mounted on said base member, an electromagnetically actuable plunger, a cable connected at one end to said plunger and looped around the hubbed portion of said lever and connected at its opposite end to said spring whereby actuation of said plunger is effective to move said lever in one direction and deactivation of said plunger is effective to move said lever in an opposite direction.

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