Jan. 22, 1963 E. W. FILEGER 3,074,201

TOY LOCOMOTIVE

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FIG. 1

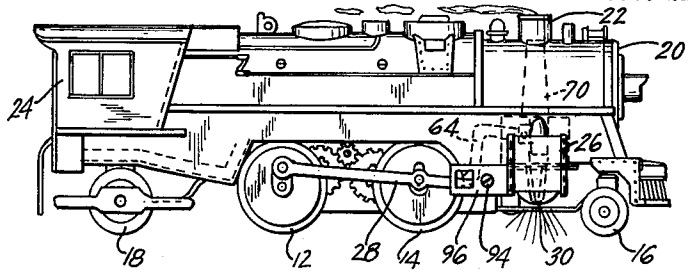


FIG. 2

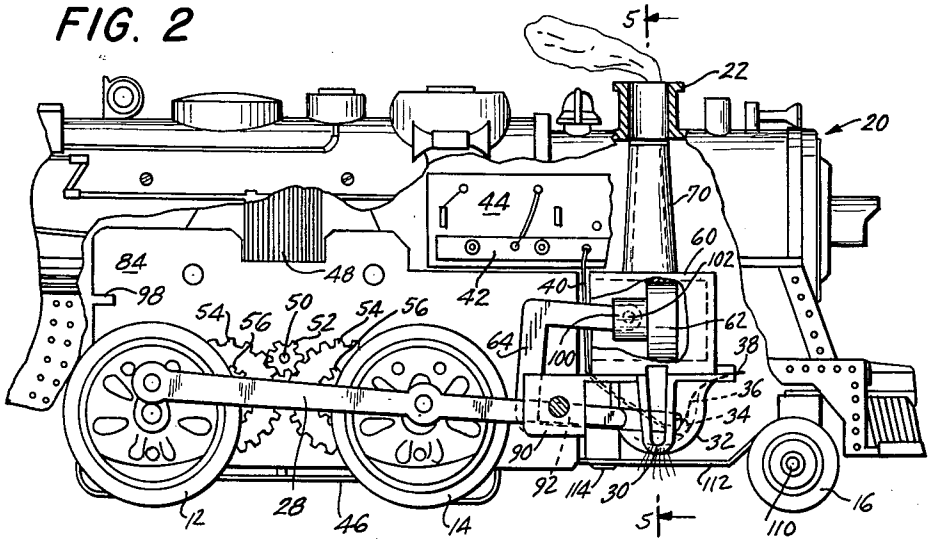


FIG. 3

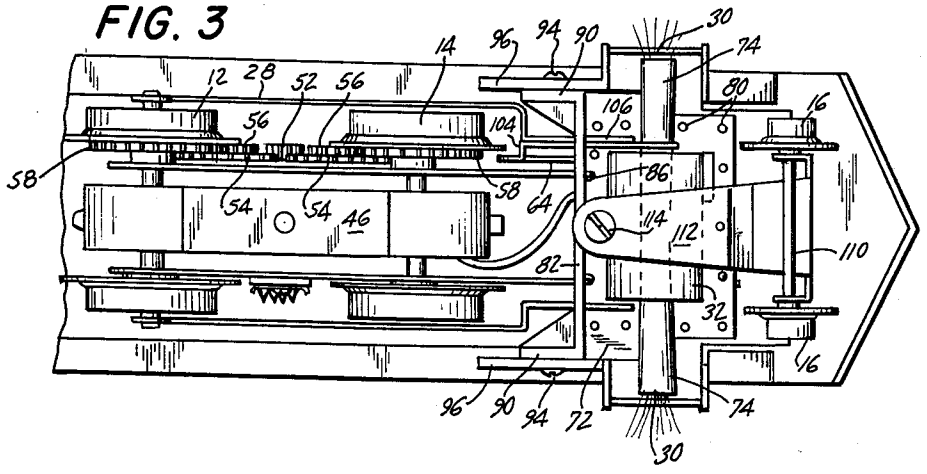
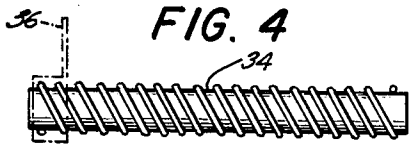


FIG. 4



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FIG. 5

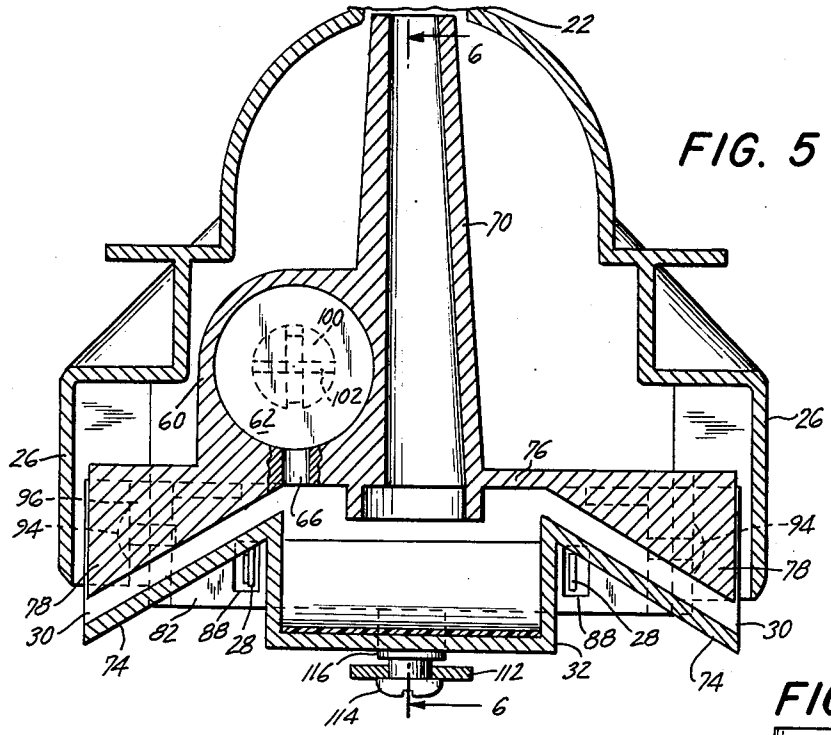


FIG. 6

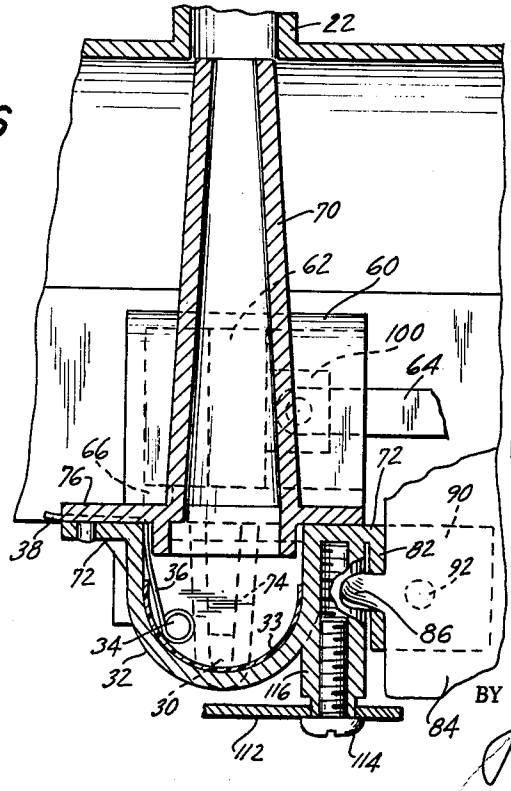
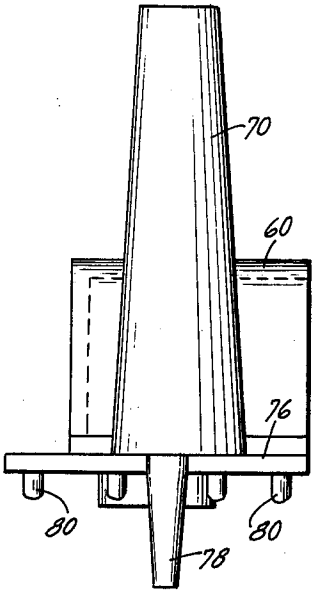


FIG. 7



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TOY LOCOMOTIVE

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3 Claims. (Cl. 46—9)

This invention relates to toy locomotives, and more particularly to electrically operated toy steam locomotives.

The general object of the invention is to improve toy locomotives which simulate steam locomotives. One feature and object is to increase the realism of such toy locomotives by simulatedly discharging steam at the sides of the locomotive, and more specifically at the simulated steam chests. The term "steam chest" is here used as a general designation for the steam cylinder and its associated valve box immediately adjacent the same.

Another object is to provide a structure which is easily manufactured at low cost, which is rugged, and which is compact enough to be used in a locomotive structure differening little, if at all, from those heretofore made without vapor generating equipment.

Still further objects are to provide for vapor discharge at the smoke stack as well as at the steam chests, and to make the discharge intermittent in puffs which are synchronized with the action of the drive rods of the locomotive.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, the invention resides in the locomotive and vapor generating elements, and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by drawings in which:

FIG. 1 is a side elevation of a locomotive embodying features of the invention;

FIG. 2 is a view drawn to larger scale with a large part of the locomotive body cut away to expose some of the interior;

FIG. 3 is a bottom plan view of the locomotive shown in FIG. 2;

FIG. 4 shows the resistance coil heating element, drawn to enlarged scale;

FIG. 5 is a transverse section taken approximately at the plane of the line 5—5 of FIG. 2;

FIG. 6 is a fragmentary longitudinal section taken approximately in the plane of the line 6—6 of FIG. 5; and

FIG. 7 is an elevation showing the upper of two cast bodies comprising the smoke generator, looking in the same direction as FIG. 6, but drawn to reduced scale.

Referring to the drawing, and more particularly to FIG. 1, the toy steam locomotive there shown has the usual driver wheels 12 and 14, supplemented in this case by pilot wheels 16 and trailing wheels 18. There is also a simulated boiler generally designated 20, with a smoke stack 22 and cab 24. The driver wheels are driven through appropriate reduction gearing by an electric motor which is concealed within the body shell 20. There are steam chests 26, and simulated drive rods 28 between the steam chests and the driver wheels.

In accordance with the present invention, the locomotive is further provided with means to generate vapor, and with discharge outlets at each side of the locomotive at the steam chests. One of these outlets is shown at 30, and the other is similarly located on the other side of the locomotive.

At the stack 22 the vapor may be thought of as simulating either steam or smoke, but in accordance with the present invention vapor simulating steam is discharged at

the side openings 30. This vapor preferably is ejected in puffs in a downward and outward direction.

Referring now to FIGS. 2 and 6, the vapor generator in the present case comprises an oil pan 32, and an electrical resistance heating coil 34 mounted in said oil pan. A lining 33 of fish paper may be placed in the pan 32 for insulation. Electrical conductors lead to the power supply circuitry of the propulsion motor, so that the coil is heated when the motor is operated. In the present case a short non-insulated conductor shown at 36 extends upward and forward, and is grounded at 38. Another and insulated conductor 40 extends rearward and then upward to a metal strip 42 which is insulatedly mounted on an impregnated fiber or other insulation plate 44 mounted on the motor frame. In the present case this forms a part of the remote-control locomotive-reversing mechanism, as previously made. The strip 42 may be considered a bus bar for receiving and distributing current picked up by a yieldable third rail contact shoe shown at 46 in FIG. 3.

Those familiar with these toys will recognize that the present locomotive is of the "O" gauge size, and runs on track sections having two grounded metal rails for the wheels, and an insulated center rail which is slidably engaged by the contact shoe 46, the latter being insulatedly mounted beneath the motor frame, and being resiliently urged downward with a light spring pressure.

Referring to FIG. 2, the field winding of the motor is indicated at 48, and its armature shaft is shown at 50, where it carries a pinion 52 meshing with compound intermediate gears 54, which carry pinions 56, meshing with gears formed directly inside the wheels 12 and 14, as shown at 58 in FIG. 3.

This motor is of a standard type and requires no further description. Some locomotives are made with the motor shaft extending in fore and aft direction, and with reduction gearing of the worm type, and the present invention is applicable to any of these different motor drives.

The vapor may be discharged continuously, but in preferred form it is discharged intermittently in puffs, preferably synchronized with the action of the drive rod 28, much as in a real steam locomotive. For this purpose the toy includes a cylinder 60 and a piston 62, the latter being connected for operation in synchronism with the drive rod. In the present case it is directly connected to one of the drive rods (the one on the right side as here illustrated), by means of a generally U-shaped arm 64 which extends rearwardly from the piston and then downward to the drive rod. There is a passage shown at 66 in FIG. 5, between the oil pan or chamber 32 and the forward or closed end of the cylinder 60. A true valve action is not needed, because the reciprocation of the piston causes an intermittent or puffing discharge of the vapor.

An additional passage or inner stack 70 may be provided from the vapor generator or chamber 32 to the smoke stack 22 of the locomotive, for vapor discharge at the smoke stack.

Considering the vapor generator in greater detail, the oil pan 32, the cylinder 60, and the passages 30, 66 and 70, are preferably provided by two cast bodies, best made of die cast metal. The lower body comprises the oil pan 32 and a horizontal flange 72 of substantial area at the top of the pan, as well as two downwardly and outwardly sloping troughs 74.

The upper die cast metal body closes the top of the oil pan 32, and it comprises a horizontal flange 76 of substantial area, an upright tube 70 leading to the smoke stack 22 of the locomotive, and a hollow enlargement at one side of the tube 70 above the flange 76, this enlargement providing cylinder 60, as is best shown in FIG. 5. The cylinder is closed at its forward end and open at its

rear end. In addition, the upper casting has wedge-shaped elements 78 located beneath the flange 76, and dimensioned to fill the troughs 74 except near the bottom thereof, where discharge passages are left, and which passages terminate in the outlets 30 previously referred to. As seen in FIG. 5, these are at the bottom of the steam chests 26.

The lower and upper die cast bodies may be secured together in any desired fashion, and in the present case this is done by providing the flange of one body with integral rivets, and the flange of the other body with holes to receive the rivets. As here illustrated it is the upper flange 76 which has the rivets, and they point downwardly, as shown at 80 in FIG. 7. They are received in holes in the lower flange 72, and the rectangular ring of such holes and rivets is seen from the bottom in FIG. 3.

The lower casting may be additionally utilized as a part of the locomotive chassis, to support the drive rods 28 and the body shell 20. For this purpose, the horizontal flange 72 of the lower body terminates at its rear edge in an upright wall 82. This abuts the forward edges of the motor frame plates 84 (FIG. 6), and the latter are provided with integral tongues 86 which project forward through mating slots in wall 82. The forward ends of the tongues are either bent or twisted to anchor the vapor generator securely to the motor frame.

The said upright wall 82 has another pair of slots, shown at 88 in FIG. 5, and these slots loosely receive the forward ends of the drive rods 28 previously described. The slots permit the drive rods to slide longitudinally and to oscillate as needed.

At its outer ends the upright wall 82 is extended rearwardly to provide parts 90 shown in FIGS. 2, 3 and 6. These have tapped holes 92 which receive screws 94 shown in FIGS. 1 and 5. The screws 94 pass through a part 96 of the locomotive body, and so secure the latter to the locomotive chassis.

At the rear end of the chassis the side plates 84 of the motor may be provided with slots 98 (FIG. 2) which receive a mating part of the locomotive body, so that the latter is supported at both its rear and forward ends. The locomotive body may be molded out of a plastics material, but is preferably made of metal in order to add weight to the locomotive, for increased traction at the drive wheels.

The piston 62 includes a projection 100, split or slotted to receive the forward end of the upper arm of the U-shaped part 64. The connection is preferably by means of a cross pin 102. The lower arm of the U-shaped element 64 is offset inwardly somewhat, as shown at 104 in FIG. 3, and is secured to the inwardly offset end 106 of the drive rod, as by spot welding the same together. The piston 62 in the present case is molded out of a plastics material, specifically high impact polystyrene. This reduces the inertia of the reciprocating element.

In the particular case here shown the heater is a piece of Balco heating element cord, ⅛ inch in diameter and one inch long. The wire diameter is 0.004, providing a resistance of 120 ohms per foot at 68 degrees Fahrenheit. There is no insulation on the resistance wire, nor on the outside of the heater. It is positioned away from the wall of the oil pan, and is additionally insulated from the wall by an inserted lining of fish paper, shown at 33, which in the present case is just over one inch square. The fish paper withstands the temperature of the heating unit.

In operation a small quantity of oil is readily put into the oil pan by use of an eye dropper or a bottle with a special cap or other suitable guide, the oil being dropped through the locomotive smoke stack 22 and the inner tube or stack 70. The device requires no further attention except replenishment of the oil supply. The oil used is a light non-toxic oil which provides a white or light colored smoke.

The pilot wheels 16 are secured to an axle 110 (FIG. 3) carried by an arm 112 which extends rearwardly and is pivoted at 114. The pivot is a screw, and the die cast lower body of the vapor generator is preferably cast with a boss 116, best shown in FIG. 6, which is threaded to receive the screw 114. The boss is shouldered or necked to receive the arm 112 for free oscillation.

The connection shown in broken lines at 36 in FIG. 4 is a piece of copper wire the lower end of which is coiled closely to fit tightly around the resistance element 34. A similar connection is provided at the other end. One connection is left bare, and the other is insulated by a sleeve of insulating material.

It is believed that the construction and operation of the improved toy steam locomotive, as well as the advantages thereof, will be apparent from the foregoing detailed description. It will also be understood that while the invention has been described in a preferred form, changes may be made without departing from the scope of the invention, as sought to be defined in the following claims.

I claim:

1. The combination with a toy steam locomotive having the usual wheels and concealed electric motor for driving the same, a simulated boiler, smoke stack, steam chests, and drive rods between the steam chests and the wheels, of means to generate vapor and to eject the same in puffs at the steam chests, and at the smoke stack, said means comprising upper and lower cast bodies of metal, the lower body comprising an oil pan with a horizontal flange of substantial area, and two downwardly and outwardly sloping troughs, the upper body closing the top of the oil pan and comprising a mating flange of substantial area, an upright tube leading to the smoke stack of the locomotive, a hollow enlargement above the flange at one side of the upright tube providing a horizontal cylinder, and wedge-shaped elements beneath the flange dimensioned to fill the aforesaid trough of the lower body except near the bottom thereof, where discharge passages are left for discharge of puffs in a downward and outward direction at the steam chests, a piston in said cylinder, and means connecting the piston to a drive rod for operation in synchronism with said drive rod.

2. The combination with a toy steam locomotive having the usual wheels and concealed electric motor for driving the same, a simulated boiler, smoke stack, steam chests, and drive rods between the steam chests and the wheels, of means to generate vapor and to eject the same in puffs at the steam chests, and at the smoke stack, said means comprising upper and lower cast bodies of metal, the lower body comprising an oil pan with a horizontal flange of substantial area, and two downwardly and outwardly sloping troughs, the upper body closing the top of the oil pan and comprising a mating flange of substantial area, an upright tube leading to the smoke stack of the locomotive, a hollow enlargement above the flange at one side of the upright tube providing a horizontal cylinder, and wedge-shaped elements beneath the flange dimensioned to fill the aforesaid troughs of the lower body except near the bottom thereof, where narrow discharge passages are left for discharge of puffs in a downward and outward direction at the steam chests, a piston in said cylinder, and means connecting the piston to a drive rod for operation in synchronism with said drive rod, the flange of one of said bodies having integral rivets, and the flange of the other body having holes to receive the same for securing the two bodies together in flange-to-flange relation.

3. The combination with a toy steam locomotive having a chassis with the usual wheels and drive rods and concealed electric motor for driving the same, and a molded shell detachably mounted around said chassis, said shell having a simulated boiler, smoke stack, and steam chests, of means to generate vapor and to eject the same in puffs at the steam chests, and at the smoke stack, said means comprising upper and lower cast bodies of metal secured to the chassis and located within the shell, the lower body comprising an oil pan with a horizontal flange of substan-

tial area, and two downwardly and outwardly sloping troughs, the upper body closing the top of the oil pan and comprising a mating flange of substantial area, an upright tube leading to the smoke stack of the locomotive, a hollow enlargement above the flange at one side of the upright tube providing a horizontal cylinder, and wedge-shaped elements beneath the flange dimensioned to fill the aforesaid troughs of the lower body except near the bottom thereof, where narrow discharge passages are left for discharge of puffs in a downward and outward direction below the steam chests of the shell, a piston in said cylinder, and means connecting the piston to a drive rod for operation in synchronism with said drive rod.

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