Dec. 3, 1929. R. C. DOMBROW 1,737,787

SMOKING TOY LOCOMOTIVE

Filed Sept. 17, 1928

Fig. 1.

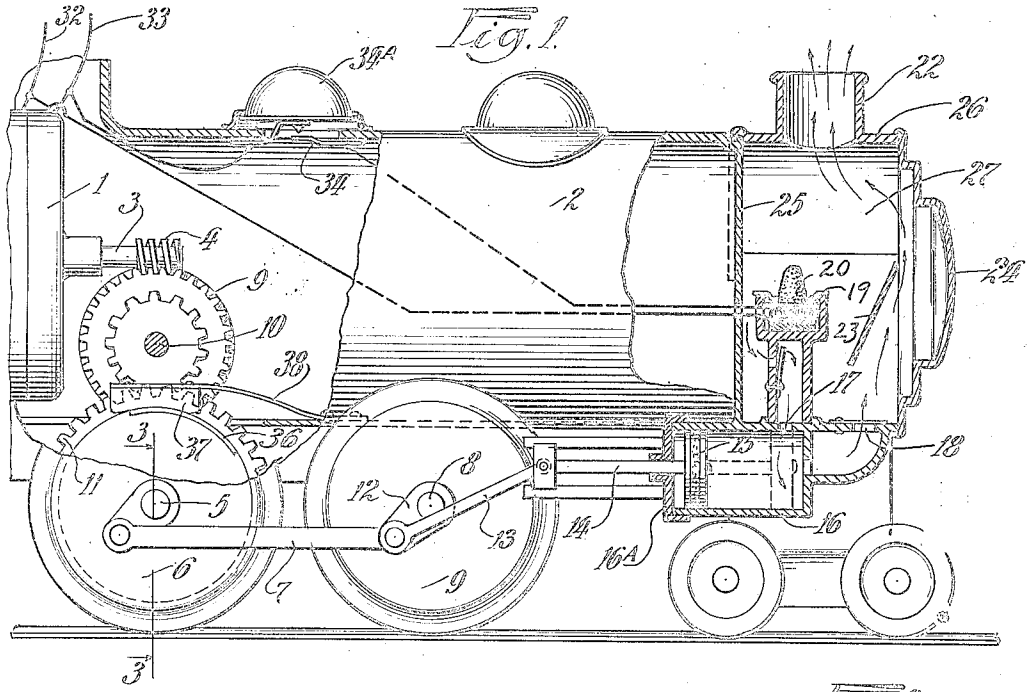


Fig. 2.

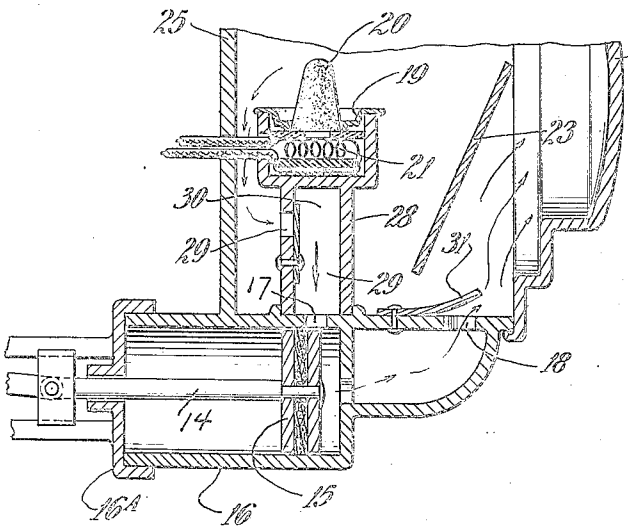
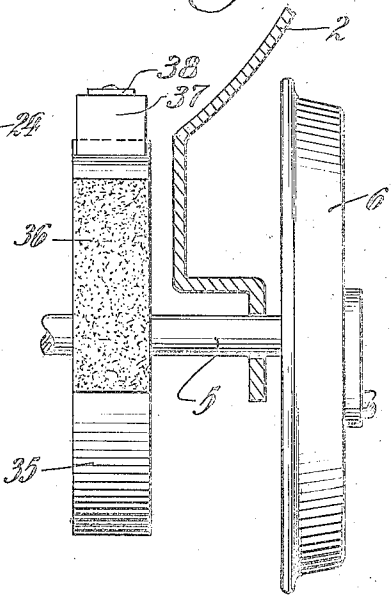


Fig. 3.



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UNITED STATES PATENT OFFICE

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SMOKING TOY LOCOMOTIVE

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My invention relates to toy electric locomotives and in its general objects aims to provide simple and effective means for simulating the smoke-puffing and the intermitting starting noise of a real steam locomotive.

In electrically operated toy railway trains, it has long been customary to fashion the forward vehicle in imitation of a steam locomotive, but such an imitation locomotive lacks two of the features which strongly impress children of the age that enjoy toy trains. One of these features consists in the issuing of smoke from a coal-fired steam locomotive, while another consists in the intermittent sound which has caused the term "choo-choo" to be used so commonly by children when referring to locomotives, or to trains of cars drawn by locomotives.

My invention aims to obviate one of these shortcomings by providing simple, inexpensive and safe means within the toy locomotive for emitting smoke, and aims to make the resulting simulation all the more impressive by ejecting the smoke in puffs through the smoke-stack of the locomotive. Furthermore, my invention aims to provide an arrangement for these purposes in which the heat for producing the smoke (or at least for igniting the smoke-producing material) is furnished by the current which also electrically drives the toy locomotive, and in which the puffing of the smoke is proportioned to the rate at which the locomotive is moving. It also aims to provide convenient means for safely housing the smoke-producing material within the locomotive and for permitting a convenient replacing of this material when it has been consumed.

In another important aspect, my invention aims to provide a toy locomotive with simple means for producing an intermittent scratchy noise in imitation of the scraping of the wheels of a real locomotive on the rails, and aims to provide an arrangement for this purpose which will cause such an intermittent "choo-choo" sound to be timed in proportion to the rate of movement of the toy locomotive.

In a still further object, my invention aims to provide a smoke-puff-producing arrangement including a pump formed in imitation of a cylinder of a genuine locomotive, which pump is adapted to eject a small amount of smoke rearwardly alongside the piston rod of this cylinder in simulation of the frequent issuing of steam alongside the piston rod of a genuine locomotive.

Still further and also more detailed objects will appear from the following specification and from the accompanying drawings, in which

Fig. 1 is a partially sectioned side elevation of the forward portion of an electrically operated toy locomotive embodying my invention.

Fig. 2 is an enlargement of a portion of Fig. 1.

Fig. 3 is an enlarged and fragmentary transverse vertical section, taken along the line 3—3 of Fig. 1.

In the drawings, Fig. 1 shows the forward portion of a toy electric locomotive which has an electric motor 1 mounted in its horizontal tubular body 2, the shaft 3 of the motor being connected through speed-reducing means to the axle 5 of one of the driving wheels 6 which axle is connected by a link 7 to the companion wheel 8 at the same side of the locomotive. Illustrative of suitable speed reducing means, I am showing the motor shaft 3 as carrying a worm 4 which meshes with a worm wheel 9 on an intermediate shaft 10, and a pinion 11 also fast on the intermediate shaft and meshing with a gear 11 which is fast on the driving wheel shaft 5.

The link 7 is connected to the forward wheel axle 8 through a crank 12, which crank is also connected through a connecting rod 13 to the forward end of the stem 14 of a piston 15 which slides in a horizontal cylinder 16 formed in imitation of one of the usual locomotive engine cylinders. This cylinder 16 underhangs the tubular body 2 and is connected to the interior of this body by an inlet port 17 and an outlet port 18, each of which ports is effectively controlled by a check valve.

Supported within the locomotive body 2 above and near the cylinder 16 is a cup 19 shaped for receiving a smoke-producing element, such as an incense cone 20, while an electric heater 21 is disposed below and close

to this incense-supporting cup. When the locomotive is being propelled by its electric motor, the piston 15 and cylinder 16 cooperate in forming a pump which alternately draws smoke of the incense into the cylinder through the inlet port 17 and ejects this smoke through the outlet port 18 and thereafter through the usual smoke stack 22.

To direct the smoke from the cylinder toward the smoke stack, instead of having it fill the entire hollow body 2 and commingle with fresh smoke from the incense, I desirably provide a baffle 23 effectively extending between the said parts and rearwardly spaced from the front 24 of the locomotive body. I also desirably provide a vertical portion 25 behind the incense support and the inlet valve, and make the upper forward portion 26 of the body (namely, the part forward of the partition 25 and including the front 24) detachable to permit access to the chamber 27 which is forward of the partition.

Illustrative of suitable incense supporting means and of suitable valves, I am here showing the incense cup 19 as socketed in the upper end of a pillar 28 which has in its lower portion a chamber 29 communicating through the inlet port 17 with the rearward portion of the smoke pump cylinder 16. This pillar 28 also has a lateral smoke admitting aperture 29 controlled by a flexible flap 30 or valve which will be swung inward by suction in the cylinder 16 when the piston 15 moves forward. The same suction draws a companion flap or check valve 31 downward to a position in which it closes the outlet port 18 while the piston is moving forward, so that the forward stroke of the piston will cause the cylinder 16 and the chamber 29 to fill with smoke. When the piston moves rearwardly, the compression of the smoke filled air behind it closes the inlet flap 30 and opens the outlet flap or valve 31, after which smoke is forcibly ejected in front of the baffle 23 and out through the smoke stack 22.

When a steadily smouldering material, such as an ordinary incense cone, is used as the smoke producing material, this only needs to be heated initially to ignite it. Hence I desirably provide means for supplying current to the electric heater 21 independent of the motor 1 for this short period. Thus, the drawings show one conductor 32 connected permanently to both the motor and one terminal of the electric heater, while the other supply conductor 33 is connected to the other heater terminal through a normally open switch 34 of a push type in which the push-button 34A simulates one of the usual steam domes on the boiler of a locomotive.

To imitate the "choo-choo" or rasping noise of a real locomotive, I am showing the wheel axle 5 as having a disk 35 fast upon it. This disk has a strip of sand paper 36 glued to its periphery and extending only for a short distance around the disk, and a friction shoe 37 (of wood or the like) is pressed against the said periphery by a spring 38. When the disk 35 rotates during the movement of the locomotive, the friction shoe is noiseless except during the short periods in which it rides upon the sand paper 36, during which intermittent periods it produces the desired rasping noise.

With my toy electric locomotive thus arranged, the user can readily depress the button 34A while the locomotive is standing still, holding this button depressed until the issuing of smoke shows that the incense has been ignited. Then the button is released and the locomotive is started in the usual manner thereby causing both the rasping "choo-choo" noise and the puffing of smoke from the smoke stack.

Since the intervals between successive rasping sounds and the intervals between consecutive puffs of smoke are both proportioned to the rate at which the locomotive travels, the effectiveness of the simulation of both is greatly enhanced. Furthermore, I desirably provide a loose fit between the piston rod 14 and the bore in the rear cylinder head 16A and also leave the piston 15 slightly loose in the bore of the cylinder, so that a relatively small amount of smoke will be ejected from the cylinder rearwardly around the piston rod during each rearward stroke of the piston, thus simulating the frequently noticeable escape of steam from a driving cylinder of a locomotive.

In the toy thus constructed, the smoke producing material is effectively housed, so that no fire is likely to occur from it, and by providing an electric heater I avoid the use of matches by children. Since incense cones are so easily procured and belch forth considerable smoke, I am able to utilize an inexpensive and readily procurable material as the source of the smoke. By making a forward body portion detachable, I permit ready access for removing even the petty ashes from the incense and for substituting a new incense cone, and by providing both a partition 25 and a baffle 23 I can intensify the puffing of the issuing smoke. So also, by using a strip of ordinary sand paper as a friction surface material and mounting this on a disk which projects below the tubular body of the locomotive, I enable the user to replace this sand paper strip when it is unduly worn.

However, while I have heretofore described my invention in connection with a particular embodiment, I do not wish to be limited to the details of the construction and arrangement thus disclosed, since modifications could obviously be made without departing either from the spirit of my invention or from the appended claims. Nor do I wish be limited to the employment of the various novel features of my invention in combination with

each other, although their conjoint use enables me to provide a particularly effective simulation of a steam locomotive at a quite low cost.

I claim as my invention:

1. In a toy electric locomotive, a hollow body, a smoke stack mounted on the body and communicating with the interior of the body, an incense support within the body in vertical alinement with the smoke stack, an electric heater disposed for heating incense supported by the said support, electrically driven means for conjointly propelling the locomotive and ejecting the smoke generated by the incense, electric supply circuits for the heater and the said electrically driven means, and heater control means for controlling the electric circuit to the heater independent of that for the electrically driven means.

2. In a toy vehicle, a hollow body simulating the boiler of a steam locomotive, a smoke stack on the said body, means within the body for producing smoke, a smoke pump arranged for ejecting smoke through the smoke stack, the smoke pump including a cylinder simulating a cylinder of a steam locomotive and a piston rod extending through a head of the cylinder, and means for conjointly propelling the vehicle and actuating the pump, there being clearance between the piston rod and the said head for permitting smoke to issue also around the said rod.

3. In a toy electric locomotive having portions simulating the usual boiler, smoke stack and engine cylinder of a steam locomotive, a partition forming a relatively short chamber within the boiler-simulating portion, means within the said chamber for generating smoke, and means for intermittently drawing smoke from the chamber into the cylinder-simulating portion and ejecting the same through the smokestack.

4. A toy electric locomotive as per claim 3, including a baffle within the said chamber for directing smoke from the cylinder-simulating portion to the smoke stack.

Signed at Chicago, Illinois, August 27th, 1928.

RUDOLPH C. DOMBROW.