

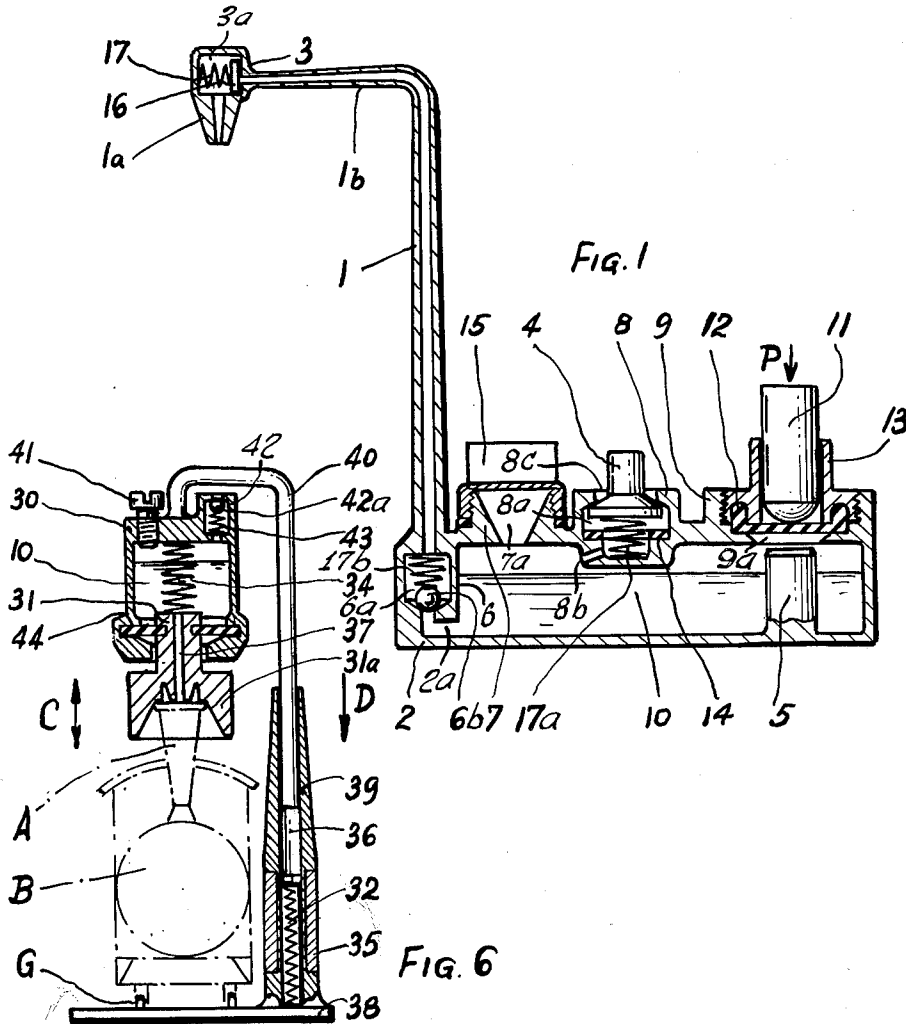
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 DEVICE FOR FEEDING THE STORAGE TANKS OF
 STEAM GENERATORS IN TOY LOCOMOTIVES

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2 Sheets-Sheet 1



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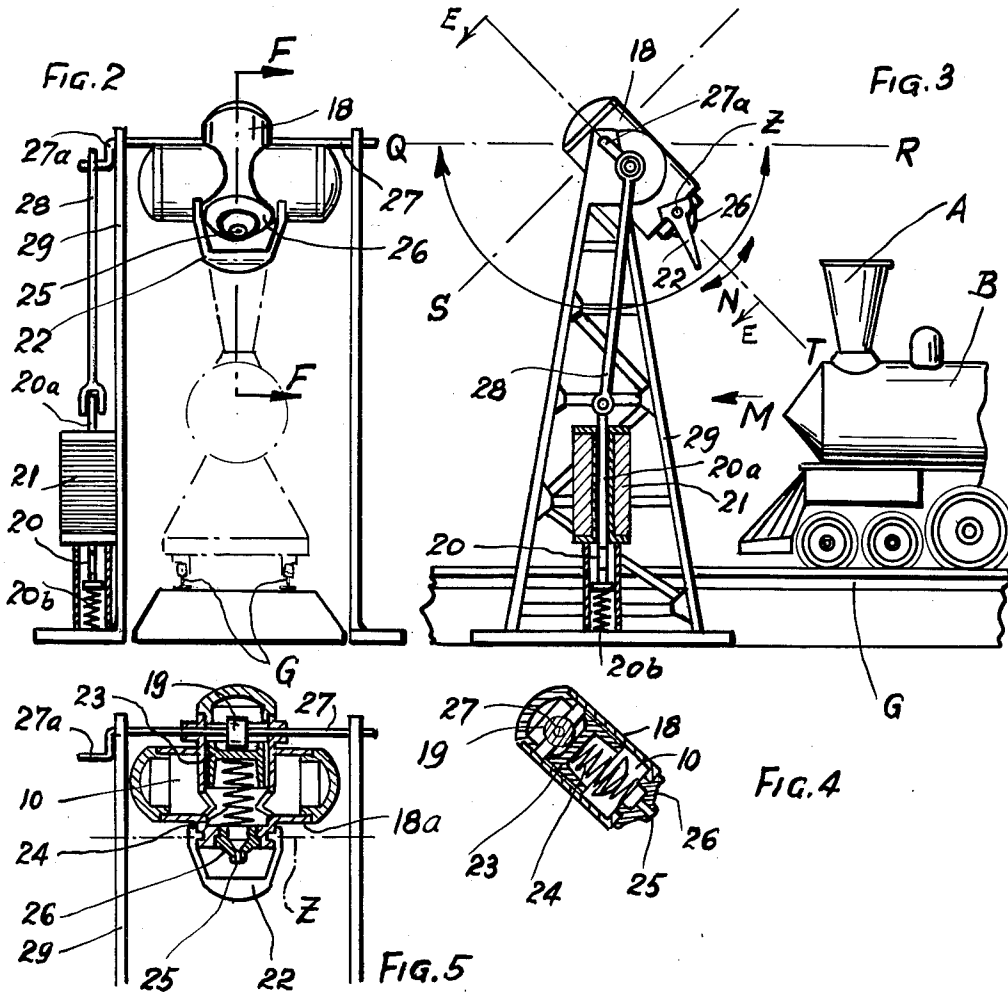
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DEVICE FOR FEEDING THE STORAGE TANKS OF STEAM GENERATORS IN TOY LOCOMOTIVES

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This invention relates to a device for feeding the storage tanks of steam generators in toy locomotives with steam generating liquid.

More specifically, the present invention proposes the construction of an apparatus which comprises a liquid storage container, pump means operatively mounted in said storage container and nozzle means adapted to conduct a steam producing liquid from said storage container into the funnel of a toy locomotive.

The need for a device of the above described character becomes apparent when one considers the difficulties encountered in refilling the steam generator tanks of toy locomotives by hand. For instance, the steam generating liquid, such as olive-oil or the like is stored in vials and then this liquid is poured by hand into the funnel of the toy locomotive. Frequently, liquid spills over because too much liquid has been poured into the funnel of the toy locomotive, which is accompanied by the soiling of hands and the track and engine of the toy locomotive.

It is, therefore, an object of this invention to provide simple and quantitatively controlled means for feeding a steam generating liquid into the storage tanks of toy locomotives without soiling the hands or the toy.

Another object of my invention is to provide a device of the above character by means of which the toy locomotive may be refueled without stopping.

A further object of my invention is to provide a device as aforesaid which is manually operated.

Still a further object of my invention is to provide a refueling device that can be remotely electrically controlled.

With the above and other objects in view the invention comprises certain new and useful constructions, combinations and specification of the drawings, which illustrate the practical embodiment of my invention, and in which:

FIG. 1 is a longitudinal section of one of the embodiments of my invention;

FIG. 2 is an elevation of another embodiment of my invention;

FIG. 3 is a side elevation of the device illustrated in FIG. 2;

FIG. 4 is a cross-sectional view along line F—F of FIG. 2;

FIG. 5 is a cross-sectional view along line E—E of FIG. 2; and

FIG. 6 illustrates yet another embodiment of my invention.

Referring now to the drawings, the embodiment of FIG. 1 comprises a storage tank 2 filled with a liquid 10 that produces steam when heated. Integral with the upper portion of the tank 2 is a vent valve having a shoulder 8 defining a valve chamber 8a and an opening 8c. Inside this chamber 8a is seated the valve element 4 which is forced upwards into the valve seat by the spring 17a. A ring 14 of rubberized material is seated in the valve chamber 8a opposite the valve element 4. The tank 2 is vented by manually pressing the valve element 4 downward against the action of the spring 17a. The gas in tank 2 can then escape via the passageway 8b past the valve element 4 through the opening 8c. A cap 15 is screwed onto neck 7 projecting from the upper portion of tank 2 adjacent to the vent valve. Neck 7 defines a funnel like opening 7a through which tank 2 may be refilled. A neck 9

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having an opening 9a projects from the upper portion of tank 2 adjacent to the vent valve opposite to neck 7. A manual pump cylinder 13 is screwed into the neck 9. A rubberized membrane 12 is secured to the lower end of cylinder 13. A pump piston 11 is slidably mounted inside the bore of cylinder 13. A stop 5 integral with the tank 2 projects upwards in axial alignment with pump piston 11. A passageway 2a leads from tank 2 to a safety valve 6 integral with the walls of tank 2. The walls of safety valve 6 define a valve chamber 6a. A ball 6 in the valve seat of valve 6 is urged against the passageway 2a by the agency of spring 17b and seals thereby passageway 2a. A feed-pipe 1 having an outlet arm 1b projects upwardly from the valve chamber 6a. At the end of outlet arm 1b integral therewith is a second safety valve 3 having a valve chamber 3a and a spout 1a. Inside the valve chamber 3a a spring 17 urges the valve head 16 against the opening of the outlet arm 1b sealing thereby the feed-pipe 1.

The device in FIG. 1 is operated by manually pushing the pump piston 11 in the direction of arrow P, thereby urging the rubberized membrane 12 downwardly against the stop 5 and creating an increase in pressure in the tank 2. This increase in pressure forces a predetermined amount of the liquid 10 through the passageway 2a, safety valve 6, the feed-pipe 1 and safety valve 3 into the funnel A of a toy locomotive.

The embodiment of my invention illustrated in FIGS. 2-5 comprises a stand 29 which is placed over the track-bed G. A shaft 27 having a crank arm 27a is rotatably supported by the legs of the stand 29. An electromagnet 20, 21 is rigidly secured to one of the legs of the stand 29. A core shaft 20a of the electromagnet is urged downwardly by a spring 20b at its lower end and is connected to the crank arm 27a by the agency of a connecting rod 28. A spring piston casing 18 is hingedly supported on the shaft 27. A cam element 19 in axial alignment with the pump casing 18 is rigidly secured to the shaft 27. The storage tank 18a for the liquid 10 is integral with the pump piston casing 18. A pump piston 23 is slidably disposed inside the pump piston casing 18 and is urged upwardly against the cam element 19 by the spring 24. The upward force of the spring 24 is substantially greater than the downward gravitational force exerted by the casing 18 via the cam 19 on the piston 23, so that the pump casing 18 and storage tank 18a may be rotated by means of the electromagnet 20, 21 without distorting spring 24 and thereby moving piston 23 downwardly. The electromagnet 20, 21 is remotely controlled by electrical control means (not shown) and rotates the piston casing 18 and storage tank 18a by means of the connecting rod 28 into one of two inoperative positions represented by the line Q—R or one of two operative positions represented by the lines S and T. The swivelling angle between the two operative positions S and T is symmetrical to the vertical so that the locomotive may be refueled while approaching the stand 29 from either direction. A nozzle 26 having an orifice 25 is secured to the lower end of the pump piston casing 18. A stop element 22 is swivelably secured to the lower portion of the casing 18. The swinging motion of the stop element 22 about its supporting axis Z is parallel to the motion of the toy locomotive B. The stop 22 has a free angle of swing of about 15°. In the event the toy locomotive B approaches the stand 29 from the direction of arrow M (see FIG. 3), the funnel A of the locomotive pushes against the stop 22 and swings the latter about axis Z until the limit of the free angle of swing N has been reached. The piston casing 18 and storage tank 18a are then swung about shaft 27 through one angle of about 90° from position T to position S. While the piston casing 18 swings through its low dead center position, the cam 19 pushes the piston 23 downward against

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the action of spring 24 and thereby forces some steam producing liquid 10 from the storage tank 13a through the orifice 25 of the nozzle 26 into the funnel A of the toy locomotive B while the latter is in motion. After the piston casing 18 passes through the low dead center position, the piston 23 moves in a counterstroke upwards through the action of spring 24.

In the event the locomotive B is not to be refueled while driving through the stand 29, the electromagnet 20, 21 is remotely electrically activated. The core shaft 20a and connecting rod 28 move then upwardly against the action of spring 20b, thereby swinging the shaft 27 via the crank arm 27a to the inoperative position R. The funnel A of the toy locomotive B passes then through the stand 29 without touching the stop 22.

The embodiment of FIG. 6 comprises a hollow upright pedestal 39 having a base 38 supporting the track G. An electromagnet 35 forms part of the pedestal 39. A gallows support 40 is slidably disposed inside the pedestal 39 and has as an axial extension the core shaft 36 of the electromagnet 35. The storage tank 30 has a screw 41 and a safety valve 42 on its upper cover. The screw 41 may be removed for refilling the tank 30. The safety valve 42 has the usual spring 43 and ball 42. Any decrease in atmospheric pressure inside the tank 30 is compensated for via the valve 42. A combination piston 31 and nozzle 31a having a passageway 37 projects downward from the tank 30 and is resiliently secured to the tank 30 and sealed off by the agency of the rubber membrane ring 44. A spring 34 urges the combination piston and nozzle downwardly.

The device in FIG. 6 is operated by activating the electromagnet 35. The gallows support is then urged downwardly against the action of spring 32. Simultaneously therewith, the combination piston 31 and nozzle 31a, which is freely movable in a limited range of motion in the direction of arrow C, is urged against the funnel A of the toy locomotive B and thereby moves in an upward pump stroke into the tank 30 against the action of spring 34. The steam producing liquid 10 is thereby forced through passageway 37 into the funnel A.

The pump stroke which forces the steam producing liquid from the storage tank into the funnel of the toy locomotive is executed, in the embodiment of FIG. 1, by the piston 11, operated by the pressure of a finger; in the embodiment of FIGS. 2-5, by the kinetic energy of the toy locomotive B acting against the stop 22 and thereby swivelling the piston casing 18 about 90°; and in the embodiment of FIG. 6, by the downward force generated by the electromagnet 35.

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Although the present invention has been described in connection with preferred embodiments, it is to be understood that modifications and variations may be resorted to without departing from the spirit and scope of the invention, as those skilled in the art will readily understand. Such modifications and variations are considered to be within the purview and scope of the invention and appended claims.

What I claim is:

1. A fueling device for toy locomotives, comprising a stand having two legs straddling the track of a toy locomotive, a shaft rotatably supported by said two legs over said track, electromagnetic means operatively connected to said shaft for rotating the same, a tank rotatably supported by said shaft, a cam rigidly secured to said shaft, piston means slidably disposed in said tank and abutting against said cam, a nozzle having swingable stop means projecting downwardly from said tank, said stop means being adapted to be engaged by a toy locomotive moving underneath said tank and swinging the latter through an angle, whereby said cam urges said piston means through a power stroke and thereby causes a predetermined quantity of liquid out of said tank through said nozzle.

2. The fueling device as set forth in claim 1, wherein said electromagnetic means are adapted to swing said tank via said cam and said piston means into an inoperative position wherein said stop means are out of the path of said toy locomotive moving over said track.

3. A fueling device for toy locomotives, comprising a stand, a shaft rotatably supported in said stand and extending over the track of a toy locomotive, a storage tank having outlet means rotatably supported by said shaft over said track, a cam rigidly secured to said shaft, pumping means operatively disposed in said tank and abutting against said cam, biasing means operatively connected to said pumping means for restoring the same from operative to inoperative position, said storage tank being adapted to be engaged by a toy locomotive passing thereunder and swiveled about said shaft, said cam thereby pressing against said pumping means and forcing a predetermined amount of liquid through said outlet means into the passing toy locomotive.

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