Feb. 4, 1958 N. P. ROSATO 2,821,808

JET PROPELLED TOY VEHICLE WITH DELAYED ACTION MEANS

Filed Oct. 21, 1955 3 Sheets-Sheet 1

Fig. 1

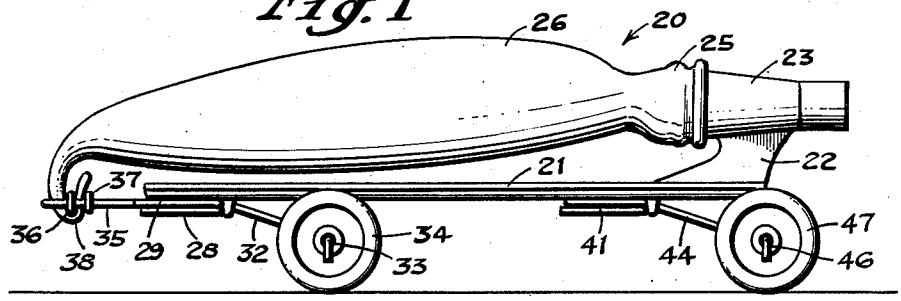


Fig. 2

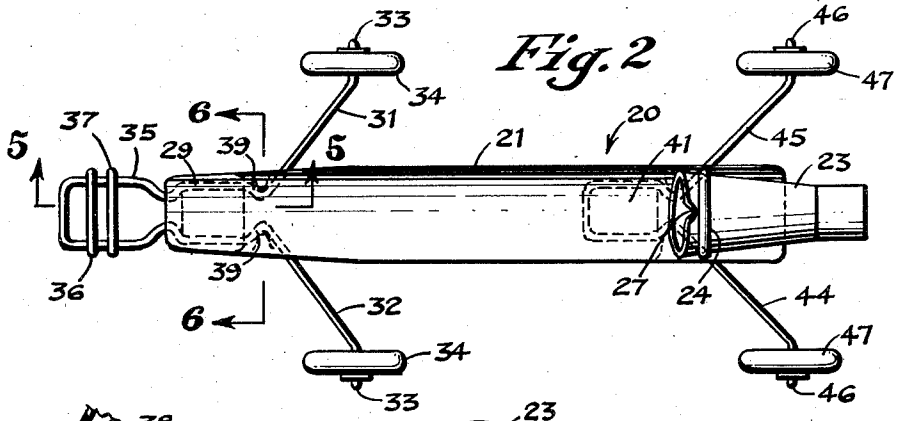


Fig. 3

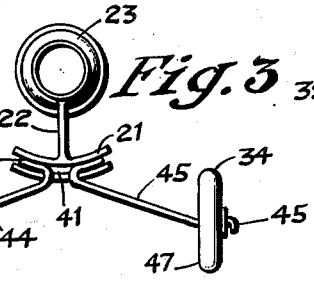


Fig. 5

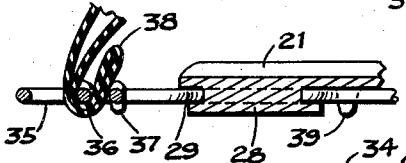


Fig. 6

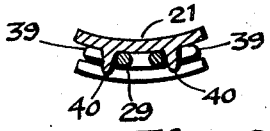
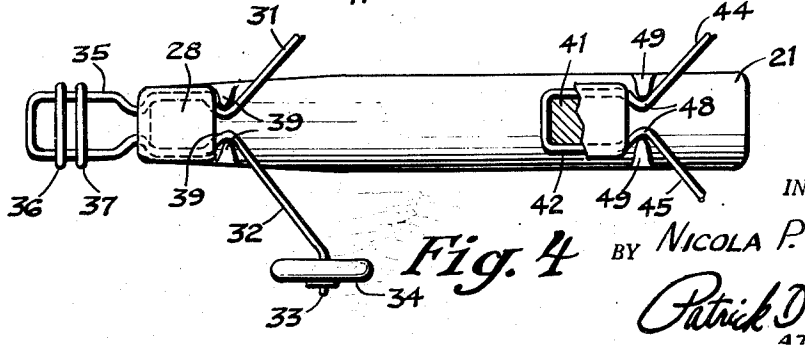


Fig. 4



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Feb. 4, 1958 N. P. ROSATO 2,821,808

JET PROPELLED TOY VEHICLE WITH DELAYED ACTION MEANS

Filed Oct. 21, 1955 3 Sheets-Sheet 2

Fig. 7

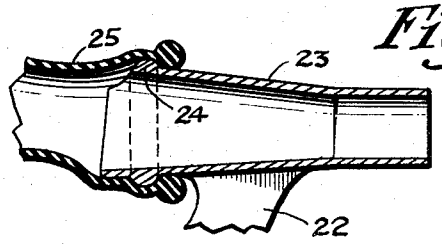


Fig. 8

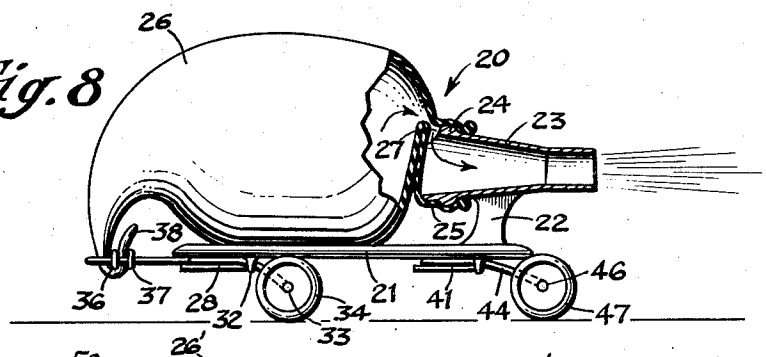


Fig. 9

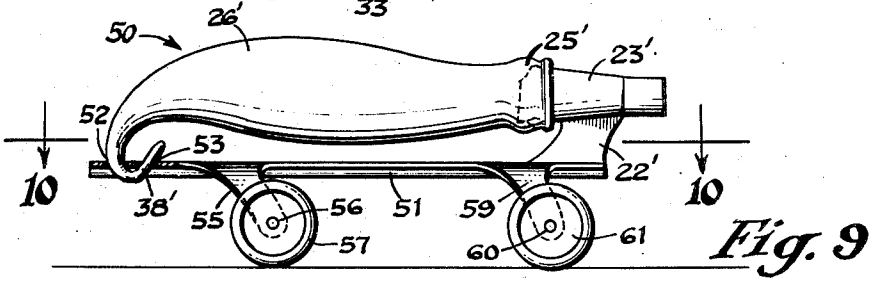


Fig. 10

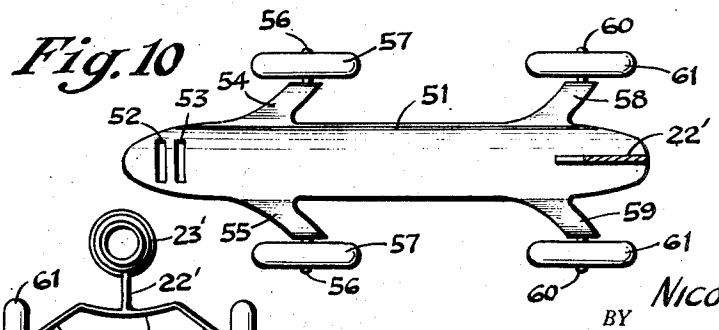
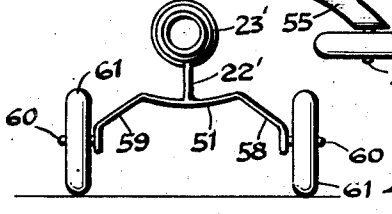


Fig. 11



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Feb. 4, 1958 N. P. ROSATO 2,821,808

JET PROPELLED TOY VEHICLE WITH DELAYED ACTION MEANS

Filed Oct. 21, 1955 3 Sheets-Sheet 3

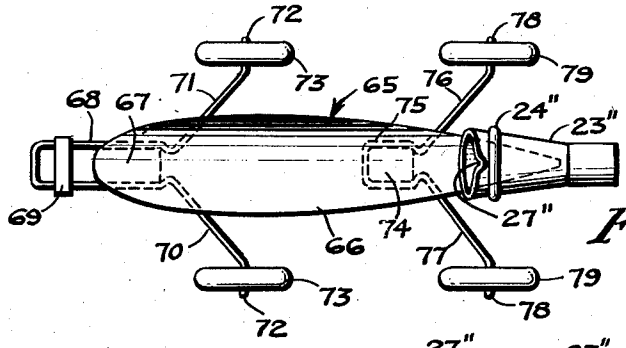


Fig. 12

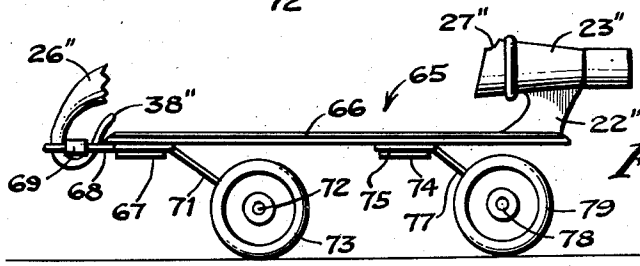


Fig. 13

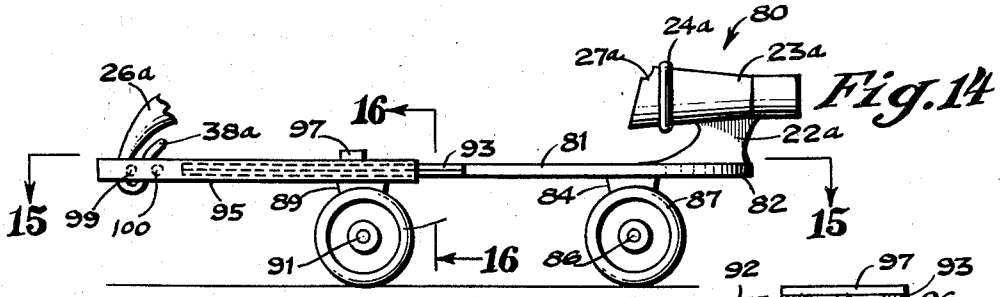


Fig. 14

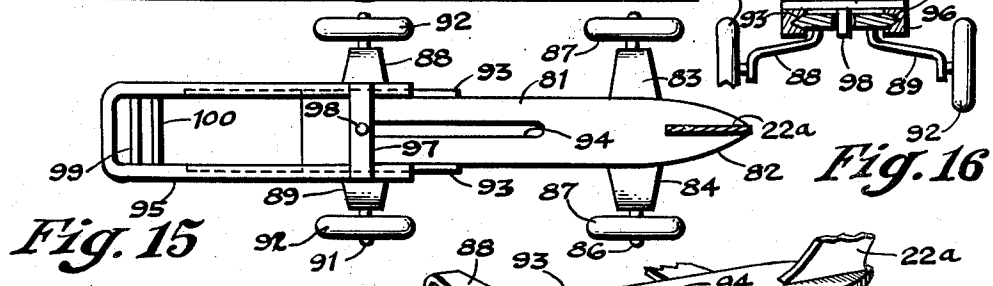


Fig. 15

Fig. 16

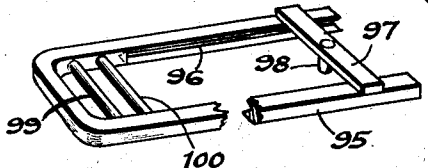


Fig. 17

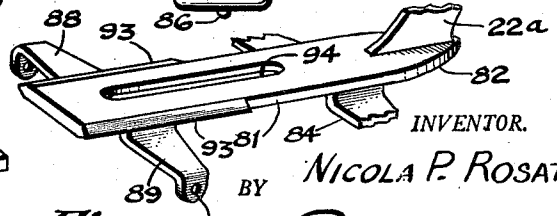


Fig. 18

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Patented Feb. 4, 1958

2,821,808

JET PROPELLED TOY VEHICLE WITH DELAYED ACTION MEANS

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Application October 21, 1955, Serial No. 541,876

1 Claim. (Cl. 46—206)

This invention relates to improvements in toy automobiles and more particularly to a toy automobile that is propelled by the jet principle that is provided by the deflating of a toy balloon.

Another object of the invention is to provide a toy automobile that is light in weight so that such weight can be overcome by the mass of air trapped in the toy balloon so that the toy automobile can be propelled forwardly with some degree of velocity.

With the above and other objects and advantages in view the invention consists of the novel details of construction, arrangement and combination of parts more fully hereinafter described, claimed and illustrated in the accompanying drawings in which:

Fig. 1 is an elevational view of one form of a toy automobile embodying the invention;

Fig. 2 is a top plan view of the automobile with the balloon removed;

Fig. 3 is an elevational view of the rear end of the toy automobile;

Fig. 4 is a top plan view of the toy automobile, partly broken away and partly in section;

Fig. 5 is a sectional view on the line 5—5 of Fig. 2;

Fig. 6 is a transverse sectional view on line 6—6 of Fig. 2;

Fig. 7 is an enlarged detailed fragmentary sectional view of the venturi nozzle of the toy automobile;

Fig. 8 is an elevational view, partly in section, of the toy automobile showing the balloon inflated and valve arrangement;

Fig. 9 is a view similar to Fig. 8 showing another form of the invention with the balloon deflated;

Fig. 10 is a longitudinal sectional view on the line 10—10 of Fig. 9;

Fig. 11 is a rear elevational view of the toy automobile of Fig. 8;

Fig. 12 is a top plan view of another form of the toy automobile;

Fig. 13 is a side elevational view of the toy automobile of Fig. 12;

Fig. 14 is a side elevational view of still another form of the toy automobile;

Fig. 15 is a top plan view, partly in section, of the toy automobile of Fig. 14;

Fig. 16 is a vertical sectional view on the line 16—16 of Fig. 14;

Fig. 17 is a perspective view of the slidable boom for the toy automobile shown in Fig. 14; and

Fig. 18 is a perspective view, partly broken away, of the chassis for the toy automobile shown in Fig. 14.

Referring more in detail to the drawings and more especially to Figures 1 to 8 inclusive, wherein one form of the invention is shown and like parts thereof are designated by like reference numerals, the reference numeral 20 is used to designate a toy automobile embodying this form of the invention.

The toy automobile 20 comprises an elongated rectangular shaped body 21 that is substantially arcuate in cross section.

On the rear end of the body 21 there is mounted in vertical relation to the plane of the body a fin 22. Integral with the upper end of the fin 22 is a venturi nozzle 23 which is provided with a circular rib 24 to engage the neck 25 of a heavy duty toy balloon 26.

The mouth of the venturi nozzle 23 is provided with a valve bleed notch 27 which will be positioned within the neck 25 of the balloon 26, as shown in Fig. 7.

Formed integral with the forward end of the body 21 is a front slotted axle support 28, Fig. 5, which receives in the slot therein a clamping portion 29 of the front axle 30. Outwardly diverging arms 31 and 32 extend from the portion 29 and an axle 33 extends approximately perpendicularly to the body 21 from the outer end of each of the arms 31 and 32. Wheels 34 are journalled on the axles 33 and a supporting portion 35 is also formed integral with the portion 29. The portion 35 supports two sliding clamp loops 36 and 37, respectively, which engage and retain the closed end 38 of the balloon 26.

A V-formation 39 is formed at the continuation of the portion 29 with each of the arms 31 and 32, respectively, and a check lug 40 is received in each of the V-formations 39 to retain the front axle 30 securely on the support 28.

There is also formed integral with the body 21, adjacent the rear end thereof, a rear slotted axle support 41 which receives in the slot therein a clamping portion 42 of a rear axle 46. Outwardly diverging arms 44 and 45 extend from the portion 42 and the axle 46 extends approximately perpendicularly to the body from the outer end of each of the arms 44 and 45. Wheels 47 are journalled on the axles 46 and a V-formation 48 is formed at the continuation of the portion 42 with each of the arms 44 and 45, respectively, and a check lug 49 is received in each of the V-formations 48 to retain the rear axle 43 securely on the support 41.

In the form of the toy automobile 50 shown in Figs. 9 to 11 inclusive, the toy automobile 50 is shown to comprise an elongated body 51 which in some respects is in the form of a cigar.

The rear end of the body 51 has formed integrally therewith a vertically disposed fin 22′ on the upper end of which is formed integrally therewith a venturi nozzle 23′. The nozzle 23′ is provided with a circular rib 24′ to engage the neck 25′ of a heavy duty toy balloon 26′. The mouth of the venturi nozzle 23′ is provided with a valve bleed notch 27*a* as shown in Fig. 14.

In this instance parallel spaced slots 52 and 53 are provided in the forward end of the body 51 to receive the closed end 38′ of the toy balloon 26′.

Outwardly diverging arms 54 and 55 extend rearwardly from the forward end of the body 51 and an axle 56 extends outwardly and approximately perpendicularly to the body from the outer ends of the arms 54 and 55 to journal a wheel 57 thereon.

Outwardly diverging arms 58 and 59 extend rearwardly from the rear end of the body 51 and an axle 60 extends outwardly and approximately perpendicularly from the outer ends of the arms 54 and 55 to journal a wheel 61 thereon.

In the form of the invention shown in Figs. 12 and 13, the toy automobile 65 has a substantially cigar shaped body 66 and a vertically disposed fin 22″ having a venturi nozzle 23″ thereon is mounted on the rear end of the body 66. The venturi nozzle 23″ has a circular rib 24″ to receive the end of a toy balloon 26″ and a valve bleed notch 27″ is formed in the mouth of the venturi nozzle 23″.

Adjacent the forward end of the body 66 a slotted front axle support 67 is formed integral with the body

and a clamp portion 68 is mounted in the slot therein. A sliding U-clamp bar 69 is mounted on the portion 68 to receive the closed end 38'' of the toy balloon 26''. Outwardly diverging arms 70 and 71 respectively, are formed integral with the clamping portion 68 and an axle 72 extends approximately perpendicularly to the body from the outer end of each of the arms 70 and 71 to journal a wheel 73 thereon.

Adjacent the rear end of the body 66 a slotted rear axle support 74 is formed integral with the body 66 and a clamping portion 75 is mounted in the slot therein. Outwardly diverging arms 76 and 77 respectively, are formed integral with the clamping portion 75 and an axle 78 extends approximately perpendicularly to the body from the outer end of each of the arms 76 and 77 to journal a wheel 79 thereon.

The principle of operation of the forms of the invention is based on the jet thrust principle and is actuated by the deflating of the toy balloon 26 through the venturi nozzle 23. The balloon is inflated until it is of a size slightly larger than the body of the toy automobile and with the toy balloon firmly retained on the body the jet thrust of the deflating action of the balloon is transferred to the body.

In operation the balloon is inflated through the nozzle, and since the closed end of the balloon is clamped by the slidable loops, the balloon cannot attain its fully inflated length. This restriction displaces the balloon to the rear of the toy against the mouth of the nozzle, Fig. 8, in the meantime the centerline of the jet nozzle is designed so that it passes through a plane much lower than the normal centerline of the now inflated balloon, this is required so that the lower edge of the inflated balloon makes contact with the top of the body. As inflation takes place this contact forces the balloon up so that the neck is in a plane above the centerline of the jet nozzle, this results in effectively sealing the mouth of the jet nozzle, thereby trapping the air in the chamber.

The notch 27 provided in the uppermost forward edge of the mouth of the nozzle is canted approximately 10 degrees from vertical axis of the nozzle. The notch is fairly critical in contour and in depth since this controls the seepage rate, or the time interval between inflating the balloon and the time lapse to place the toy on the ground or floor for subsequent action. A well designed notch should allow between 4 to 8 seconds of elapsed time before action takes place.

The 10 degree canted mouth of the nozzle is designed so as to allow the balloon to collapse much more rapidly, thereby giving greater impetus to the toy. The rapid collapse of the chamber results in a rapid discharge of air through the nozzle and the resulting thrust propels the toy forward at an extremely rapid rate.

Since the balloon provides only a limited amount of pressure and volume, the weight of the toy automobile is critical and for best performances the toy automobile should be light enough for the static weight thereof to be overcome by the mass of air trapped in the balloon. The weight of the toy automobile should therefore be limited to the point where the thrust provided by the toy balloon can readily propel the toy forward at an extremely rapid velocity.

While the principle of operation of the form of the toy automobile shown in Figs. 14 to 18 is the same as described for the previous forms the construction of the body of the toy automobile is different and will now be described.

In Figs. 14 to 18 the toy automobile 80 comprises a body or chassis 81 which is rectangular in shape having a pointed rear end 82 on which is mounted a vertically disposed fin 22*a*. A venturi nozzle 23*a* is mounted on the upper end of the fin 22*a* and the nozzle 23*a* is provided with a circular rib 24*a* on which is mounted the neck of a toy balloon 26*a*. The mouth of the venturi nozzle 23*a* is provided with a valve bleed notch 27*a* and these parts of the toy automobile 80 are similar to the parts previously described for the former forms of the invention.

Oppositely disposed axle supports 83 and 84, respectively, extend outwardly from the rear end of the body 81 and openings 85 are provided in the axle supports 83 and 84 to receive an axle 86 on which are journalled wheels 87. There are also outwardly disposed axle supports 88 and 89 respectively, adjacent the forward end of the body 81, and openings 90 in the axle supports 88 and 89 receive an axle 91 on which are journalled wheels 92.

Bevelled projections 93 extend from the forward end of the body 81 for a portion of both of the longitudinal edges of the body 81 and an elongated slot 94 is positioned in the body 81 along the central longitudinal axis of the body 81. A U-shaped sliding boom 95 has bevelled recesses 96 therein which coact with the bevelled projections 93 on the body 81.

A bar 97 extends across the open end of the U-shaped boom 95 and a stop pin 98 depending below the bar 97 centrally thereof is engaged in the slot 94 in the body 81.

A pair of transversely extending rods 99 and 100, respectively, extend across the boom 95 adjacent the closed end of the boom 95. The rods 99 and 100 engage and retain the closed end 38*a* of the toy balloon 26*a*. With the neck of the balloon 26*a* secured to the mouth 27*a* of the venturi nozzle 23*a* and the closed end 38*a* of the balloon 26*a* secured to the U-shaped sliding boom 95, the balloon 26*a* may extend beyond the confines of the body 81 and thus more air may be retained in the balloon 26*a* as the boom 95 slides toward the forward end of the body 81 until its movement is stopped by the pin 98, and thus greater velocity may be obtained by the toy automobile 80, although this form of the toy automobile operates on the same principle as the forms of the invention previously described.

It is believed that from the foregoing description, the construction and operation of the various forms of the invention will be clear to those skilled in the art and it is to be understood that changes in the minor details of construction, arrangement and combination of parts may be resorted to provided they fall within the spirit of the invention and the scope of the appended claim.

Having thus described the invention what is claimed as new and desired to be secured by Letters Patent is:

A toy automobile comprising a body having a horizontal upper face, supporting wheels for said body, a fin extending upwardly from the rear end portion of said body, a rearwardly directed nozzle mounted upon the upper end of said fin, a toy balloon having an elongated body and a neck, said neck encompassing the forward end portion of said nozzle, and clamping means connecting the forward end of said balloon body to the forward end of said automobile body, said nozzle having a notch formed in the upper edge of the forward portion thereof, and said balloon body having a longitudinal axis, when inflated, at a greater distance from the upper face of the automobile body than the longitudinal axis of said nozzle, whereby, upon inflation of said balloon, a portion thereof will overlie the forward end of said nozzle and said notch will function as a temporary bleed valve.

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