Oct. 26, 1926. 1,604,294

L. MARX

SAND LOADER TOY

Filed Nov. 14, 1925

Fig. 1.

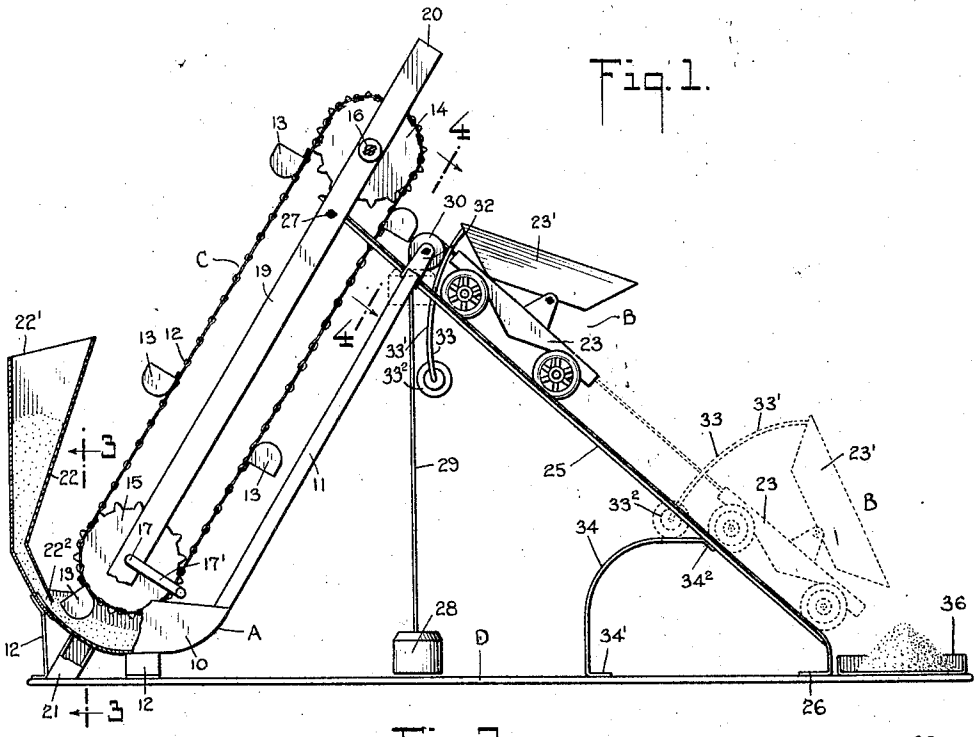


Fig. 2.

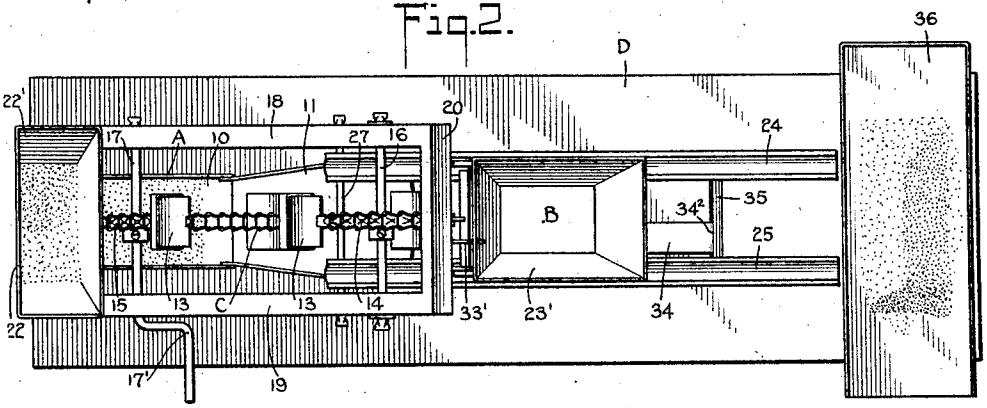


Fig. 3.

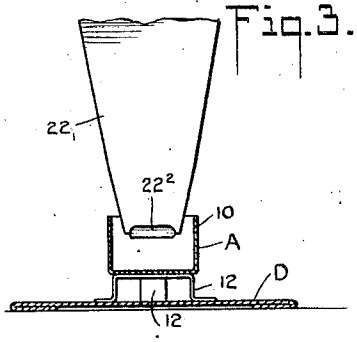
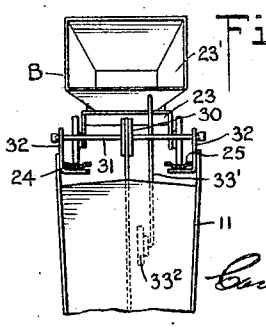


Fig. 4.



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SAND-LOADER TOY.

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This invention relates to toys, and more particularly to mechanically operated toys; and has special reference to the provision of an improved sand loader toy.

The principal object of my present invention comprehends the provision of an improved sand loader toy of the type in which a conveyor is manually operated for carrying or conveying a load of sand from a sand supply receptacle to an elevated station and there deposited for further conveyance, as for example on mechanical dumping trucks automatically movable from the elevated station to a dumping station, the prime desideratum of the invention residing in the provision of a sand loader toy construction which may be operated with facility and efficiency by the child.

As is well known, in this type of sand loader toy, the conveyor, usually of the endless chain and bucket variety, is movable for conveying or carrying a sand load from the supply receptacle to a loading station, the buckets receiving their charge in their passage through and from the supply receptacle, the sand removed from the supply receptacle by the conveyor being replenished by the child from time to time. The operation of these sand loader toys of prior construction is attended with comparative inconvenience and difficulty by reason of the lack of definite cooperation between the conveying means and the supply receptacle. If the level of sand, for example, in the supply receptacle is too high, the sand offers too great a resistance to the movement of the conveyor buckets, and if the sand level is lowered, the amount of sand removed from the receptacle by the conveyor is comparatively small, necessitating tedious and frequent manual replenishing of the same, especially when the supply receptacle is of comparatively small dimensions and capacity. One of the principal objects of the invention, therefore, resides in obviating this objection, and more particularly in providing means for effecting a predetermined cooperation between the conveyor and the supply receptacle whereby a substantially constant sand level is maintained in the receptacle over an extended period of operation, with the sand level disposed so as to offer a minimum of resistance to the operation of the conveyor, the parts cooperating to effect a gradual feeding of the sand into the receptacle over an extended period of time in proportion to the removal of sand from the receptacle by the conveyor.

A still further object of the invention comprehends the provision of a sand loader toy embodying a dumping truck movable between an elevated loading station and a descended dumping station, the said dumping truck being automatically moved to the elevated loading position in the absence of a sand load therein, and being automatically movable to the descended dumping position when a predetermined sand load is supplied thereto, the construction including means automatically operated for effecting a dumping action of the truck when the same arrives at the descended dumping station.

Further objects of the invention include the provision of a sand dumping toy in which the parts are arranged to cooperate in a simple way to produce attractive action, the parts being coordinated to permit continued mechanical service with a minimum effort on the part of the child, the structural and functional cooperation being, moreover, such as to permit the toy to be manufactured at low cost.

To the accomplishment of the foregoing and such other objects as may hereinafter appear, my invention consists in the elements and their relation one to the other as hereinafter more particularly described and sought to be defined in the claims, reference being had to the accompanying drawings which show the preferred embodiment of my invention, and in which:

Fig. 1 is a vertical side elevational view of the toy with parts broken away,

Fig. 2 is a plan view of the same,

Fig. 3 is a fragmentary view of the same taken in cross-section on the line 3—3, Fig. 1, and

Fig. 4 is a fragmentary view of the same taken in cross-section on the line 4—4, Fig. 1.

Referring now more in detail to the drawings, the improved sand loader toy of my invention comprises generally a sand supply receptacle or bin A, a dumping truck generally designated as B and movable from an elevated loading position as shown in full lines in Fig. 1 of the drawings to a descended dumping position as shown in dotted lines in said figure, a conveyor generally designated as C for conveying charges of sand from the supply receptacle A to the elevated loading station for depositing such

sand into the dumping truck B, the supply receptacle, the conveyor and the dumping truck being mounted and supported upon a base generally designated as D.

The supply receptacle A comprises a receptacle proper or bin 10, preferably made of sheet metal, provided with an inclined chute extension 11 also preferably made of sheet metal for receiving the "droppings" of sand from the conveyor C for return to the bin 10, the said receptacle or bin being supported on the sheet metal base D by means of one or a plurality of bracket members 12, 12.

The conveyor C is preferably of the chain and bucket variety, and comprises an endless chain 12 carrying at spaced points the plurality of buckets 13, 13, the said chain being trained over upper and lower chain sprockets 14 and 15 fixed to the upper and lower shafts 16 and 17 which are journalled in the side frame members 18 and 19 of a U-shaped frame 20 supported in inclined position, as by being fixed as at 21 to the base plate D. The lower shaft 17 is preferably a crank shaft, and is provided with a hand-operated crank portion 17′ extending to one side of the frame 20 so that the same may be manually manipulated by the child for operating the conveyor or sand elevating means.

As heretofore mentioned, the operation of sand loader toys of prior construction of the character discribed is attended with considerable inconvenience and difficulty by reason of the lack of definite cooperation between the conveying means and the supply receptacle. From a consideration of Fig. 1, for example, it will be seen that if the level of sand in the receptacle A is substantially above that indicated in the drawings, the sand offers too great a resistance to the movement of the conveyor buckets, and if the sand level is reduced to that indicated in the figure, the amount of sand removed from the receptacle by the conveyor is comparatively small, necessitating tedious and frequent manual replenishing of the same by the child. Moreover, the supply receptacles are of comparatively small dimensions and capacity, and the supply of sand therein is too small to move into the path of the moving buckets to fill the space left by the preceding buckets, this being another factor necessitating frequent replenishment of the sand supply. To obviate these objections, I provide means operative for effecting a predetermined coordination between the conveyor and the supply receptacle whereby a substantially constant sand level is maintained in the receptacle over an extended period of operation, with the sand level disposed so as to offer a minimum of resistance to the operation of the conveyor, and with the parts cooperating to effect a gradual feeding of the sand into the receptacle over an extended period of time in proportion to the removal of sand from the receptacle by the conveyor, thus rendering the operation facile and efficient.

To accomplish these ends, I provide a sand receiving hopper 22 having an enlarged entrant mouth 22′ for readily receiving the supply of sand, and having a reduced or restricted exit mouth 22^2 communicating with the supply receptacle and disposed substantially tangentially to the locus of movement of the conveyor buckets 13, as clearly shown in Figs. 1 and 3 of the drawings, the construction being such that in the movement or operation of the conveyor C, the buckets remove the sand adjacent the exit mouth 22′ of the hopper 22. By means of this construction the sand supply in the hopper 22 gradually feeds into the supply receptacle 10 through the mouth 22^2 in proportion to the removal of sand from the receptacle by the conveyor buckets, the amount feeding from the hopper into the supply receptacle being substantially that removed from the receptacle by a bucket. To concentrate the supply of sand at or about the locus of bucket movement, the lateral dimension or width of the mouth 22′ of the hopper is made substantially equal to the width of the bucket 13. By means of this construction, therefore, the child may take a rather copious supply of sand and dump the same into the hopper 22, and the sand will automatically feed into the receptacle in small quantities in proportion to the sand discharged therefrom, permitting amusement without that tediousness and difficulty resulting from and incident to the operation of prior toys of this character.

The dumping truck B heretofore referred to comprises a wheeled vehicle 23 having a swivelled dumping receptacle 23′ movable from the loading position shown in full lines in Fig. 1 to the dumping position shown in dotted lines in said figure, the said dumping truck being movable on a pair of runways 24, 25 preferably made of sheet metal and suitably grooved to provide running tracks for the truck, the said runways being held in inclined position by being affixed as at 26 to the base plate D, and being suitably affixed to a rod 27 held in the side frame members 18 and 19 of the frame 20.

The truck B is automatically operated so as to be movable to the elevated loading position in the absence of a sand load therein, and to the descended dumping position when a predetermined load is deposited into the truck; and to this end I provide a weight-operating means comprising a weight 28 flexibly connected by means of a cord 29 to the wheeled vehicle 23, the said cord being guided over a guide pulley or sheave 30 fixed to a spindle or shaft 31 which is journalled in angle bracket portions 32, 32 affixed in

any suitable manner to the guide chute 11. By means of this construction, it will be apparent that the weight 28 will automatically move the truck to the loading station for receiving a load of sand, and that when a predetermined load of sand is deposited in the truck, the latter will move in opposition to the weight to the descended dumping station.

For effecting a dumping action of the truck as the same arrives at the descended dumping station, I provide cooperating elements carried by the truck and positioned at the dumping station, said elements including more specifically a cam follower arm 33 preferably affixed to the swivelled receptacle 23′ and a cam guide 34 attached at 34′ to the base plate D and at 34^2 to a cross-piece 35 secured in turn to the guideways 24 and 25. The cam follower arm in the preferred construction comprises a curved rod 33′ to the lower end of which is attached a roller or wheel 33^2 which moves over the cam guide 34, as shown in Fig. 1 of the drawings, when the truck arrives at the dumping station for dumping the load in the truck.

In the preferred construction, I provide a movable container 36 arranged at the dumping station for receiving the load of sand, the said container being preferably open at one end so as to permit the ready sliding of the sand therefrom, this container being removable from the base plate D when a sufficient supply of sand is received thereon for returning the sand to the receiving hopper 22.

The operation of my improved sand loader toy will in the main be fully apparent from the above detailed description thereof. It will be seen that the conveyor is readily operated by the child without resistance for elevating the supply of sand from the supply receptacle A to the loading station where said supply is deposited into the truck B, the said truck moving from the full line position to the dotted line position shown in Fig. 1 when the same receives a predetermined load. The truck B in arriving at the dumping station is operated by the cam follower 33 and the cam guide 34 for removing the load of sand from the truck and depositing the same into the container 36. The container 36 is then taken and the supply therefrom dropped into the entrant mouth of the hopper 22. It will be seen that the cooperation of the parts is such that the conveyor may be operated for a long time without replenishing the supply of sand in the receptacle, and only after extended periods of operation is it necessary to move the discharged sand from the container 36 and deposit the same into the hopper. The dumping truck operates automatically, and the sand is fed continuously for a long period and automatically into the supply receptacle for effecting the efficient operation.

While I have shown my invention in the preferred form, it will be apparent that many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention, defined in the following claims.

I claim:

1. A sand loader toy comprising a sand supply receptacle, an inclined runway, a dumping truck movable on said runway between an elevated loading station and a descended dumping station, said truck being provided with a swivelled dumping receptacle, chain and bucket elevating means for conveying sand from the supply receptacle to the elevated station and for depositing the same directly into said truck, weight mechanism for automatically moving the truck to the loading station in the absence of a load therein and for permitting the said truck when loaded to move to the dumping station in opposition to said weight mechanism, and means including a cam follower arm fixed to said swivelled receptacle and a cam guide at said dumping station cooperating when the truck arrives at the dumping station for actuating the swivelled receptacle to dump the load therefrom and to permit the truck to return to the loading station.

2. A sand loader toy comprising a base, a sand supply receptacle on said base, an inclined runway supported on said base, a dumping truck movable on said runway between an elevated loading station and a descended dumping station, said truck being provided with a swivelled dumping receptacle, manually operable chain and bucket elevating means for conveying sand from the supply receptacle to the elevated station and for depositing the same directly into said truck, the elevating means and the runway being arranged in the same vertical plane, mechanism including a weight flexibly connected to said truck for automatically moving the same to the loading station in the absence of a load therein and for permitting the said truck when loaded to move to the dumping station in opposition to said weight mechanism, means including an element carried by said truck and an element positioned at said dumping station cooperating when the truck arrives at the dumping station for actuating the swivelled receptacle to dump the load therefrom and to permit the truck to return to the loading station, and a movable container at said dumping station for receiving the load, said container being movable to the supply receptacle for returning the sand thereto.

3. A sand loader comprising a sand supply receptacle, conveying means movable through said receptacle for conveying sand from the supply receptacle to a loading station, and a sand receiving hopper having a restricted

exit mouth communicating with the supply receptacle, the said exit mouth being disposed adjacent the locus of movement of the conveying means and so that the conveying means in its movement sweeps past and in close proximity to said exit mouth whereby the sand accumulating about said exit mouth is removed by the conveying means and the sand in the hopper is made to gradually feed into the receptacle in proportion to the removal of sand from the receptacle by the conveying means.

4. A sand loader comprising a sand supply receptacle, bucket conveying means movable through said receptacle for conveying sand from the supply receptacle to a loading station, and a sand receiving hopper having a restricted exit mouth communicating with the supply receptacle, the said exit mouth being disposed adjacent the locus of movement of the buckets of the conveying means and so that the buckets in their movement sweep up and past in close proximity to said exit mouth whereby the sand accumulating about said exit mouth is removed by the conveying means and the sand in the hopper is made to gradually feed into the receptacle in proportion to the removal of sand from the receptacle by the conveying means.

5. A sand loader comprising a sand supply receptacle, conveying means movable through said receptacle for conveying sand from the supply receptacle to a loading station, and a sand receiving hopper having a restricted exit mouth communicating with the supply receptacle, the said exit mouth being disposed substantially tangentially to the locus of movement of the conveying means and so that the conveying means in its movement sweeps past and in close proximity to said exit mouth whereby the sand accumulating about said exit mouth is removed by the conveying means and the sand in the hopper is made to gradually feed into the receptacle in proportion to the removal of sand from the receptacle by the conveying means, the parts cooperating so that a substantially constant sand level is maintained in the receptacle over an extended period of operation with a minimum of sand resistance to the operation of the conveyor.

6. A sand loader toy comprising a sand supply receptacle, a bucket conveyor for carrying sand from the supply receptacle to a loading station, and a sand receiving hopper having a restricted exit mouth communicating with the supply receptacle and disposed substantially tangentially to the locus of movement of the conveyor buckets and so that the buckets in their movement sweep past in close proximity to said exit mouth, the lateral dimension of the said mouth being substantially equal to the lateral dimension of said conveyor buckets, the cooperation of the parts being such that movement of the conveyor buckets removes the sand adjacent the hopper mouth and permits a gradual feeding of the sand into the supply receptacle in proportion to the removal of sand from the receptacle by the buckets whereby a substantially constant sand level is maintained in the receptacle over an extended period of operation with a minimum of sand resistance to the operation of the conveyor.

7. A sand loader toy comprising a base, a sand supply receptacle on said base, a sand receiving hopper having a restricted exit mouth communicating with the supply receptacle, an inclined runway supported on said base, a dumping truck movable on said runway between an elevated loading station and a descended dumping station, said truck being provided with a swivelled dumping receptacle, manually operable chain and bucket elevating means for conveying sand from the supply receptacle to the elevated station and for depositing the same directly into said truck, mechanism including a weight flexibly connected to said truck for automatically moving the same to the loading station in the absence of a load therein and for permitting the said truck when loaded to move to the dumping station in opposition to said weight mechanism, means including an element carried by said truck and an element positioned at said dumping station cooperating when the truck arrives at the dumping station for actuating the swivelled receptacle to dump the load therefrom and to permit the truck to return to the loading station, and a movable container at said dumping station for receiving the load, said container being movable to the hopper for returning the sand thereto.

Signed at New York city, in the county of New York and State of New York, this 12th day of November A. D. 1925.

LOUIS MARX.