June 23, 1942. O. F. REITER 2,287,133

TOY

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Fig. 1.

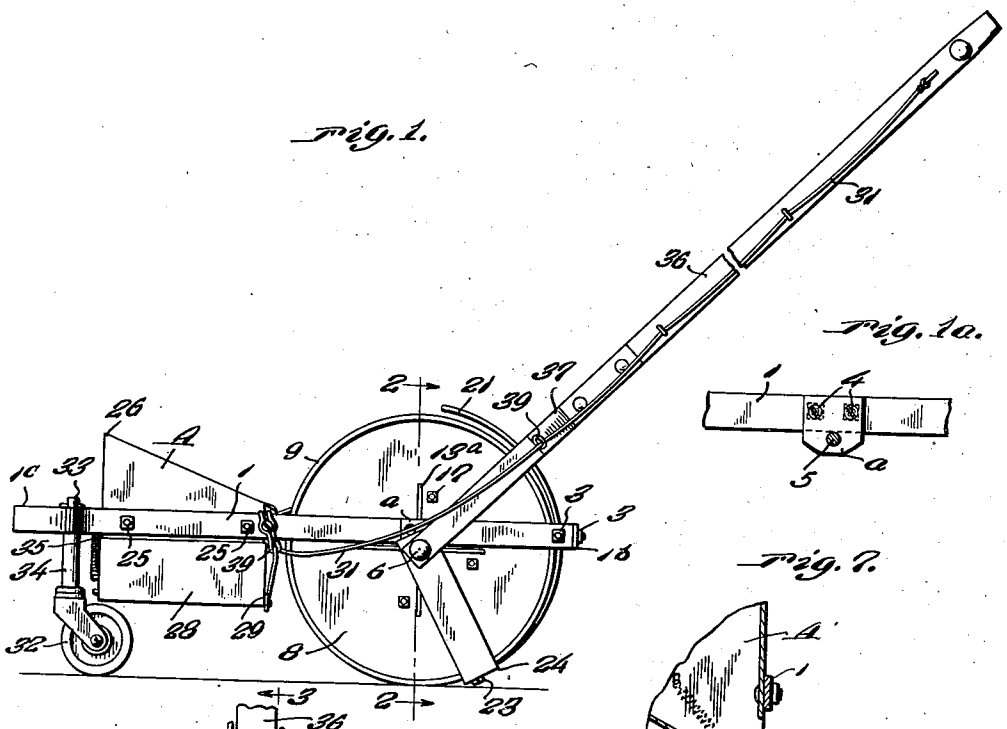
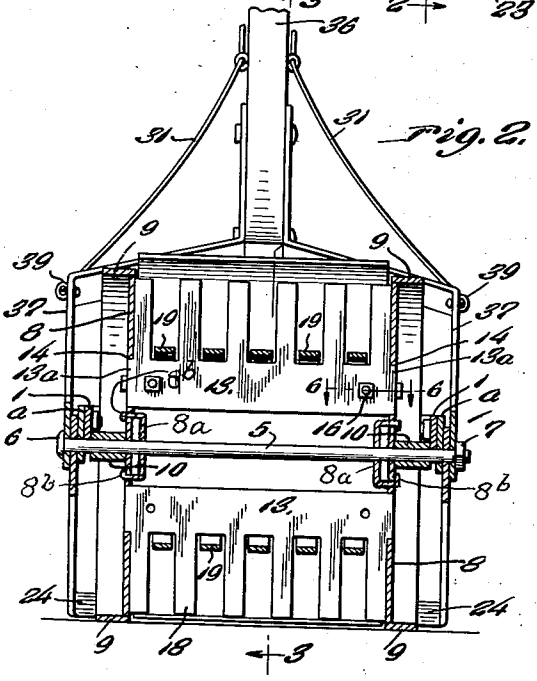


Fig. 1a.

Fig. 7.

Fig. 2.



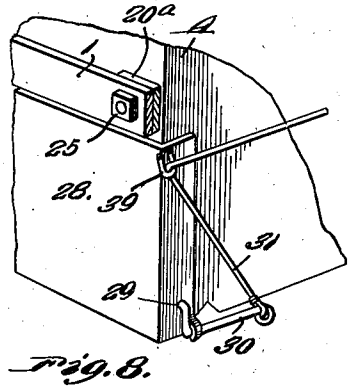


Fig. 8.

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Fig. 3.

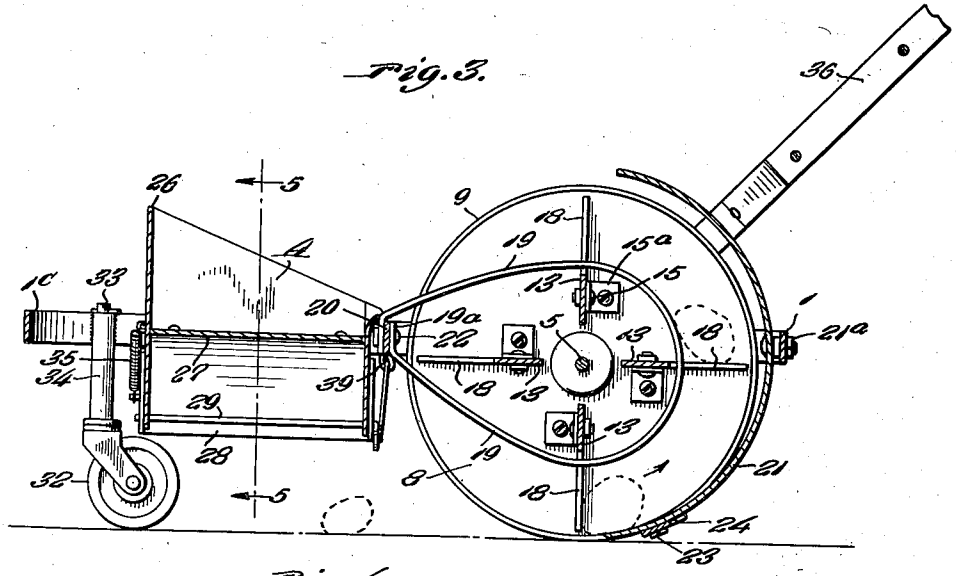


Fig. 4.

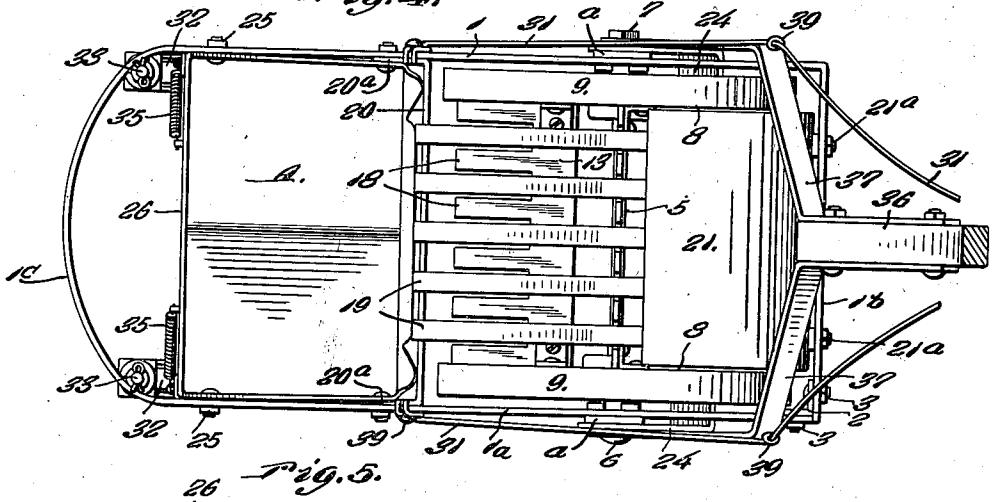


Fig. 5.

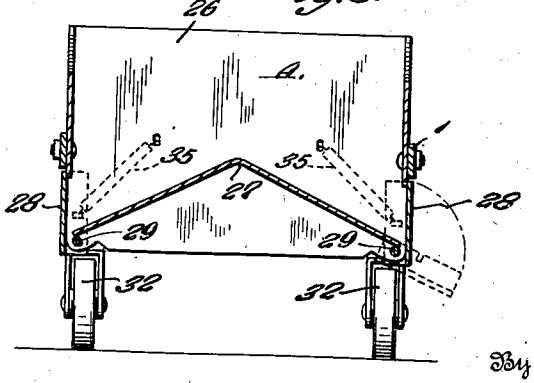
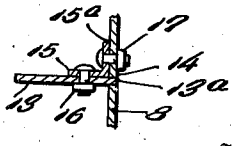


Fig. 6.



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UNITED STATES PATENT OFFICE

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TOY

Otis F. Reiter, Baltimore, Md., assignor to Fastpic Corporation, Baltimore, Md., a corporation of Maryland

Application December 31, 1940, Serial No. 372,658

10 Claims. (Cl. 55—17)

The invention concerns a miniature form of apparatus for picking up stones, nuts, marbles or other objects to be employed as a toy for the amusement and training of children.

One object of the invention is to embody in the form of a toy some of the principles involved in full size or standard apparatus, while at the same time simplifying the construction and rendering possible its manufacture at a low cost.

The invention is illustrated in the accompanying drawings in which

Figure 1 is a side elevation of the invention.

Fig. 1*a* is a detail view of a part of the frame and a hanger attached thereto.

Fig. 2 is a vertical sectional view on the line 2—2 of Fig. 1.

Fig. 3 is a vertical sectional view on line 3—3 of Fig. 2.

Fig. 4 is a plan view of the machine.

Fig. 5 is a vertical sectional view through the hopper on the line 5—5 of Fig. 3.

Fig. 6 is a detail view in section on line 6—6 Fig. 2 of a part of the connection between the main carrying wheels or discs.

Fig. 7 is a detail view of a part of the hopper and a dumping door therefor.

Fig. 8 is a perspective view of part of the hopper, dumping door and operating connection.

In these drawings 1 indicates a horizontally disposed frame member made of a strip of flat sheet metal, set up on edge, the ends of said metal strip being brought together at the rear left hand corner of the frame work and secured together by bracket 2, Fig. 4 of metal arranged on the inner side of the metal strip 1 and secured thereto by the nuts and bolts 3. This main frame member 1 is in one piece including side bars, a rear cross bar 1*b* and a front cross bar 1*c* which latter is of curved formation.

The main frame member is bent into the form just mentioned.

A hanger *a* is secured by screws 4 to the outer sides of the side bars of the main frame and these hangers support a cross bar or shaft 5 which has a head 6 on one end. Its other end is screw threaded and receives a nut 7 by which the said cross bar is held in place in the hangers *a*. This cross rod or shaft affords a bearing for the wheels 8 which are preferably of metal in disc form, each provided with a flange 9 forming the tread of the wheel which bears upon the ground. These discs or wheels are made of sheet metal and they may be stamped to suitable shape. These wheels are spaced from the main frame bars 1 by sleeves or cylindrical tubular members 10, Fig. 2 loosely threaded on the cross rod or shaft 5. Said sleeves bear on the wheels at one end and at their other ends upon the side bars of the main frame 1.

The carrying wheels 8 are connected with each other to rotate in unison as one body by stone lifting members consisting of sheet metal pieces 13 in the form of flat bars extending from one wheel to the other. The ends 13*a* of these flat bars enter slots 14 Fig. 2 formed through the disc body portions of the carrying wheels, the fit between the bar ends 13*a* and the walls of the slots 14 or openings 14 being such that the flat bars of sheet metal will be held against play or displacement. Augmenting the holding of these cross bars immovably in relation to the discs or wheels are brackets consisting of pieces of flat metal bent substantially at right angles so that one part 15 of the brackets can be attached by screws or bolts 16 to the face of the cross plates 13, Fig. 6 and the other part 15*a* of the bracket can be attached to the web or disc of the carrying wheel by the screws or bolts 17. These cross plates or bars attached to the carrying wheels or discs make them move in unison. The plates or bars have each a series of stone lifting arms 18 which are spaced apart from each other so as to pass between track or stone conveyor or directing bars 19. These conveyor bars 19 are each in the form of a loop encircling the cross shaft or bolt 5 and having its forward ends secured to a cross bar 20 of strap metal which extends between the side bars 1*a* of the frame. The connection between these side bars and the cross bar 20 consists of the foot portions 20*a* of the cross bar bolted or screwed to the side bars on the inner side thereof.

These spaced apart conveyor bars form a grid. The stone lifting arms have travelling movement between these conveyor bars. The stone lifting arms describe a circular path which carries the ends of the stone lifting arms close to the ground so that any stone or similar object which lies in the path of these arms will be picked up and moved along the conveyor bars towards the front of the machine where they are discharged in a forward direction into a suitable hopper. The stone lifting arms register with and travel along the spaces between the conveyor bars.

These conveyor bars are supported by the means above described substantially fixedly to the cross bar of the frame. The stone lifting arms are flat and may be stamped or cut out of the sheet metal piece which furnishes the sheet metal connecting plates between the discs of the carrying wheels.

The stone lifting arms participate in the revolution of the carrying discs or wheels but have no independent movement relative to the carrying wheels. They have no individual pivotal or other movement, but revolve as integral parts of the carrying wheel organization. The stone lifting arms are long enough to describe paths that reach near to the ground so as to contact

any stones or like objects that lay in their paths. These stone lifting arms cooperate with a plate or guide 21, Fig. 3, which is curved and lies close to the paths described by the ends of the stone lifting arms.

The stone lifting arms push the stones upwardly along this guide plate which acts to direct the stones and prevents them from flying off at a tangent. This guide plate is long enough to insure the lodgment of the stones onto the conveyor or director bars 19 and their movement forwardly and downwardly along said conveyor bars to be deposited in the hopper designated generally by the reference character A. In other words, the guard plate 21 reaches over the grid made up of the spaced apart conveyor bars 19 far enough (see Fig. 3) that there will be no danger of the stones flying off at a tangent.

This guard plate is imperforate. It is of sheet metal and its curvature corresponds closely to the curved paths described by the stone lifting arms.

The conveyor bars are supported only at their front ends for which purpose one end 19a of each bar bears against the rear face of the cross bar 20 and the other end of the conveyor bars contact the front face of the cross bar 20 and a bolt or screw 22 passes through the ends of the conveyor bars and through the cross bar 20. The curved guard plate 21 is held in fixed relation to the organization by bolts or screws 23 connecting said plate to a metal member or strap 24, which is hung from the main cross bolt or shaft 5.

The apparatus being in miniature or in toy form is not intended to be operated under adverse conditions and therefore there will be little or no need for self adjustment or a yieldable quality in certain of the parts. Thus the conveyor bars 19 need not have yielding capacity but may be substantially rigidly mounted instead of being constructed and arranged to yield to prevent clogging of the material passing through the stone picking and conveyor means.

The hopper A is mounted within the forward part of the main frame. This hopper is mounted within the strap of metal comprising the main frame by bolts or screws 25. The wall of the hopper increases in height towards the front of the apparatus, the cross wall 26 being the highest so that it will prevent any stone or other object escaping over it to the front of the machine.

The hopper has a bottom wall 27, Fig. 5, which inclines from the central portion to each side so that when the side doors 28 are opened, the contents of the hopper will be discharged by gravity off to one side of the path of travel of the machine. Each of the side walls is pivotally mounted at its lower portion by fixing it to a rock shaft 29 suitably mounted in the hopper structure, said rock shaft having an arm 30 from which a flexible connection 31 extends through a guide to a point where the user may operate it for dumping the hopper by opening the door or doors.

The side doors are under pressure of spring means 35 by which said doors are closed automatically.

The forward end of the main frame is mounted on caster wheel 32. For mounting these casters they each have a stem or shaft 33 mounted to turn in an elongated bearing 34 secured to the main frame bar on the inner side of the same. The shaft is held in the bearing by any suitable split pin or other fastening.

The toy is adapted to be propelled by means of a handle. This consists of the handle 36 proper and a piece of strap metal 37 secured to each side of the handle 36 and extending respectively to the opposite ends of the main cross rod or shaft 5 on which the strap metal member 37 is mounted so as to turn thereon. The parts mounted on the shaft or bolt 5 will retain their positions so long as the bolt 5 remains in the position it is intended to occupy, and for maintaining it in said position a nut 7 is employed.

The flexible connection or cord 31 used for operating the dumping doors of the hopper extends through the guide eyes 39 to a point within easy reach of the user for manipulation of the hopper doors.

It will be noticed that the construction is simple. The main frame is composed of a single piece of strap metal bent into the desired shape, and having its ends brought together and fastened by a suitable coupling piece or bracket 2. This single strap of metal is set up on edge and affords bearings for the main carrying wheel organization, for forward caster wheels or other guiding means at the front of the toy. It also furnishes support for hopper means as well as for a handle for propelling the appliance and for a support for a guard or shield which cooperates with the stone lifting arms in directing the stones upwardly and forwardly onto the conveyor bars 19.

The carrying wheel structure and the stone lifting arms and the carrying bar or plate therefore are built into an organization whereby economy of manufacture is enhanced.

The main frame member of strap metal provides the spaced apart side bars which are arranged parallel with each other and this single strip of comparatively thin and light sheet metal also provides the cross bar at the rear and the cross bar at the front. Being set up on edge this frame bar though thin is strong and durable and affords ample support for the hopper at the front of the appliance.

The main carrying wheels instead of being stamped out can be formed by forming the flange 9 separately from the discs 8 and then uniting these parts in any suitable manner including a driving fit.

The cross bar 20 to which the forward ends of the conveyor bars 19 are attached is provided with forwardly bent end portions fitting against the inner sides of the side bars of the main frame and bolted as at 20a to said side bars.

By fitting portions of the plates which carry the stone lifting arms in slots of the carrying wheels the driving of the stone lifting arms can be accomplished without straining the connections between the plates 13 and the carrying wheels.

The guide plate 21 is made of one piece of sheet metal which is imperforate and presents a smooth unbroken surface upon which the stones will pass as they are lifted by the lifting arms. This form of plate will guide the stones, and being imperforate there will be no openings in which a stone may lodge and cause a jam and damage.

This guide plate besides being supported at its lower front end by the sheet metal strap 24 is also supported from the rear cross bar of the frame 1 as shown in Figs. 3 and 4 by the bolts 21a.

The carrying wheels 8 are provided with hubs 8a preferably made hollow and of sheet metal pressed into the shape shown and fastened to the sheet metal discs 8 by projections 8b. These

hubs will provide a strong bearing on the axle and prevent the wheels from wobbling.

I claim:

1. A miniature or toy stone picker having a main frame member consisting of a metal strip in one piece set up on edge with side bars, a front and a rear cross bar, the ends of said strip metal member being connected together, a cross bolt or shaft mounted on said side bars and extending laterally beyond said side bars, carrying wheels mounted on said shaft at points within said main frame and spaced from said side bars, stone lifting arms carried by said wheels, said lifting arms being spaced apart, and conveyor bars for receiving the stones which are elevated by the stone lifting arms, said conveyor bars being spaced apart for the movement of the stone lifting arms between them in a direction towards the front of the machine, and means by which the appliance can be moved forwardly consisting of a handle having portions pivotally mounted on the cross bolt or shaft outside the side bars of the main frame.

2. In combination in an appliance of the character described, a main frame consisting of a single metal strap horizontally disposed, and bent to form a substantially rectangular member, carrying wheels mounted in said frame, caster wheels mounted at the front corners of said frame and cooperating with the carrying wheels to hold the main frame in horizontal position, a cross rod or shaft connected with the side bars of the main frame, said carrying wheels being mounted on said cross rod, and a handle having side arms pivotally mounted on said cross rod outside the main frame, substantially as described.

3. In combination in an appliance of the character described a main frame consisting of a metal strap in one piece set up on edge and bent to provide side bars, a rear cross bar and a front cross bar, and means connecting the ends of said metal strap together, carrying wheels mounted on a cross bar or shaft connected with the main frame side bars, caster wheels or the like mounted on the main frame at the front end thereof and adapted to bear on the ground for maintaining the said main frame substantially horizontal, a hopper arranged between and supported by the side bars of the said main frame, stone lifting arms connected with the carrying wheels to rotate therewith, and a guide plate curved to conform approximately with the path of movement of the stone lifting arms, a bracket mounted on the cross rod and connected with said curved guide for supporting the same, substantially as described.

4. In an appliance of the character described and in combination a frame, a pair of carrying wheels, a cross rod or shaft connected with the main frame and on which shaft the said carrying wheels are mounted and plates extending between and connected with the carrying wheels to revolve therewith, said plates having stone lifting arms integral therewith, said stone lifting arms being cut from said plates, substantially as described.

5. A toy picking machine for stones, nuts, marbles or the like having a main frame, a pair of main carrying wheels, a cross rod or shaft carried by the main frame and extending laterally beyond the same, caster wheels at the front of the machine, a hopper carried by the main frame forward of the main carrying wheels and in rear of the caster wheels, plates extending from one carrying wheel to the other and rigidly fixed thereto, said plates having integral therewith stone lifting arms, a handle for pushing the appliance, said handle being mounted on the cross rod, said hopper having doors, and connections from the doors leading to the handle for manipulation of said doors, substantially as described.

6. In combination in a toy stone picker, a pair of carrying wheels arranged at opposite sides of the machine, plates rigidly connecting the said wheels together, said plates having extensions fitting in slots of the wheels whereby said plates will be moved with said wheels and stone lifting arms integral with the said plates, substantially as described.

7. In combination in an appliance of the character described, a frame carrying wheels, stone lifting arms connected with the wheels, conveyor bars for receiving the stones lifted by the said arms, a guide plate at the rear of the machine, said plate being curved to guide the stones as propelled by said lifting arms upwardly and forwardly, said plate presenting throughout an unbroken surface for contact with the stones.

8. In combination in apparatus of the class described, a frame consisting of strap metal set upon edge, and bent to shape, a cross bar within said frame also consisting of strap metal set up on edge and secured to the metal member first mentioned, conveyor bars supported by said cross bar, a shaft supported by the frame, sheet metal discs mounted on the shaft serving as carrying wheels, said discs having flanges connected therewith, metal plates having portions seated in openings in said discs, means for securing the plates to the discs, said plates carrying integral therewith stone lifting arms, a guide plate at the rear of the machine composed of sheet metal presenting an unbroken guiding surface, a sheet metal strip supporting the forward lower end of said guide plate from the shaft, a connection between said guide plate and the rear bar of the frame, and a handle comprising sheet metal strips mounted on said shaft, substantially as described.

9. In combination in apparatus of the class described a main frame, an axle connected therewith, carrying wheels on the axle, stone picking arms carried by the wheels and hubs of sheet metal bearing on the axle and having projections connected with the wheels for holding said hubs in place.

10. In combination in an appliance of the character described, a frame, a pair of carrying wheels, a cross rod or shaft connected with the main frame and on which shaft the said carrying wheels are mounted, and plates extending between and connected with the carrying wheels to revolve therewith, said plates having stone lifting arms integral therewith, said carrying wheels being of sheet metal having openings through the body thereof, and said plates having portions fitting in said opening, substantially as described.

OTIS F. REITER.