B. F. BAIN,

MECHANICAL TOY.

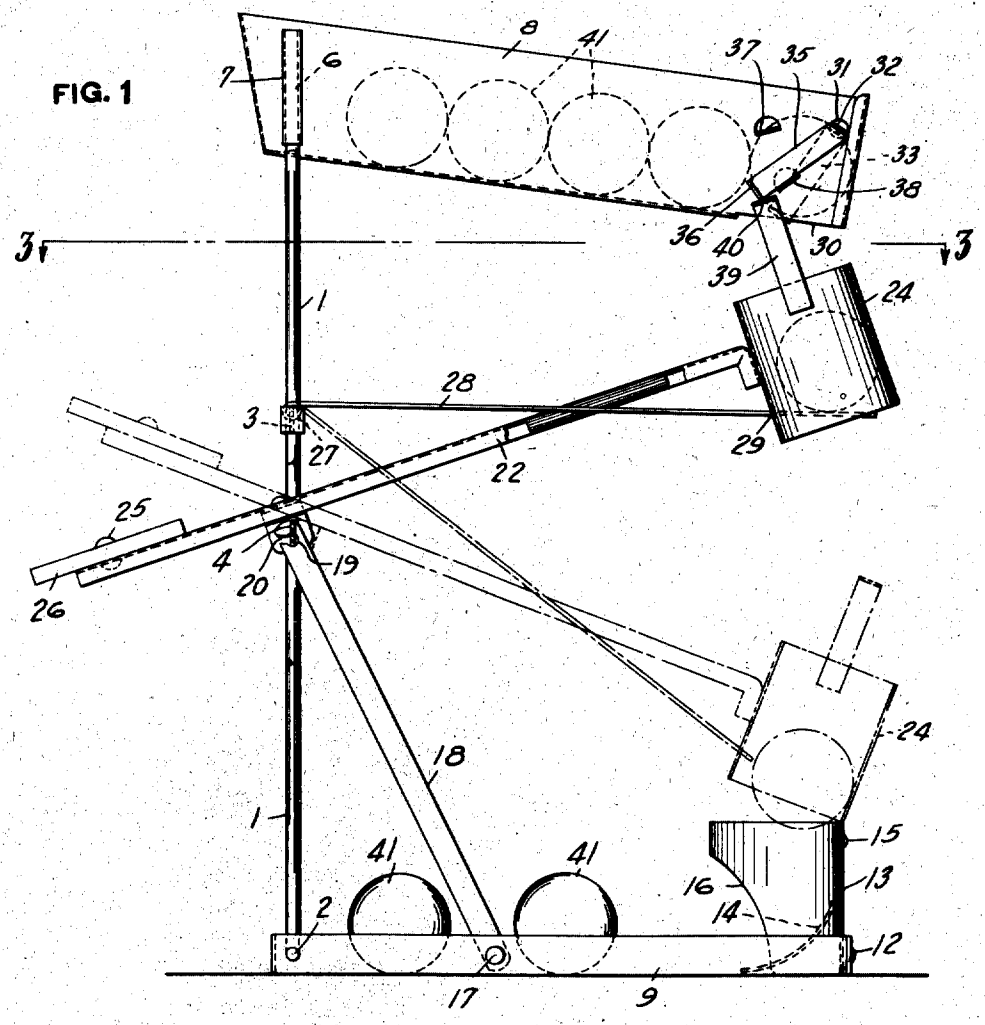
APPLICATION FILED APR. 9, 1917.

1,244,457.

Patented Oct. 30, 1917.

2 SHEETS—SHEET 1.

FIG. 1



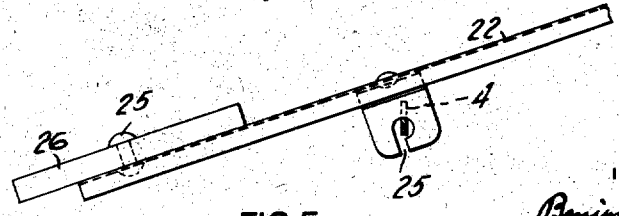


FIG. 5

WITNESSES

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MECHANICAL TOY.

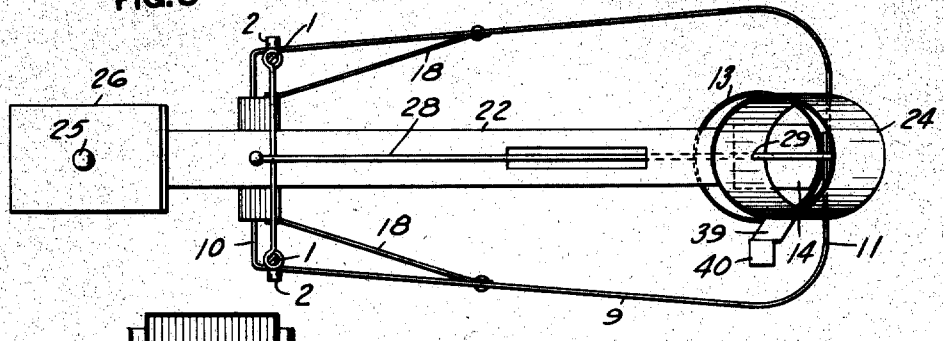
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2 SHEETS—SHEET 2.

FIG. 3



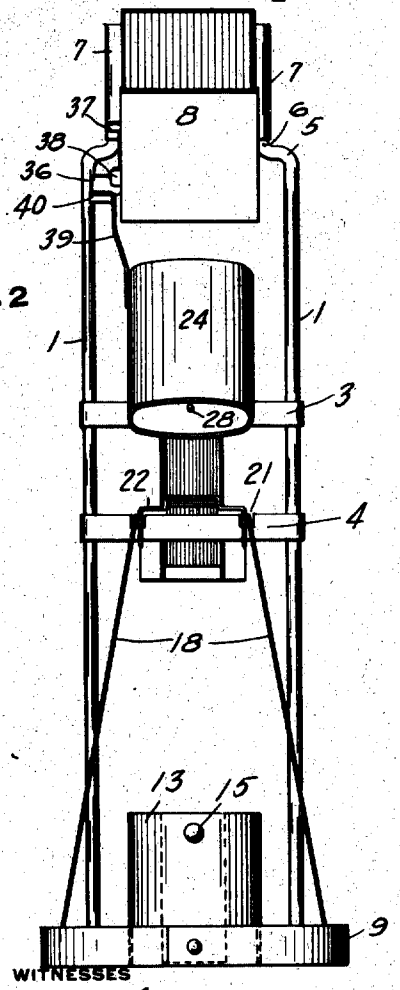


FIG. 2

FIG. 4

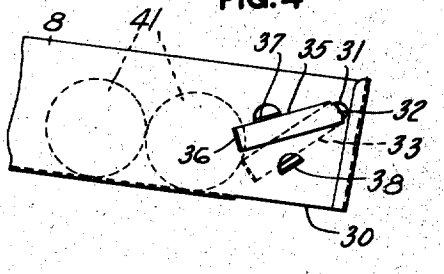
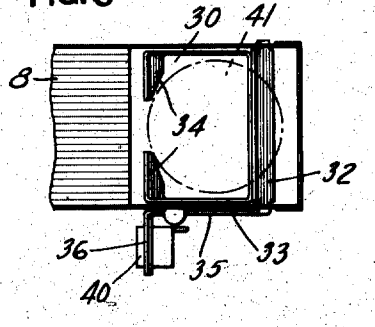


FIG. 6



WITNESSES

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MECHANICAL TOY.

1,244,457. Specification of Letters Patent. Patented Oct. 30, 1917.

Application filed April 9, 1917. Serial No. 160,868.

To all whom it may concern:

Be it known that I, BENJAMIN F. BAIN, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Mechanical Toys, of which the following is a specification.

This invention relates to automatic toys and more particularly to devices of that class embodying a pivotally mounted movable member adapted to travel up and down by reason of a load supplied thereto from a storage container, and by reason of a counterweight suitably connected to one end of the movable member. It is intended to furnish an automatic toy of the class described in a form which is strong and durable, and in which the members may be readily separated and packed in small space. The device is entirely automatic and continuous in operation. Its construction and method of assembly allow it to be made very cheaply. In operation it closely simulates a form of the ordinary trip or helve hammer used in heavy forging work.

Other objects and advantages of the device will appear throughout the following specification, and will be obvious to those familiar with such toys.

Referring to the drawings, Figure 1 is a side elevation showing in full lines the toy in load-receiving position, the movable member being raised, while in dotted lines is shown the toy in load-discharging position the movable member being at the lower limit of its travel; Fig. 2 is a front elevation of the device with the movable member in raised position; Fig. 3 is a partial horizontal section and plan view on the line 3—3 of Fig. 1; Fig. 4 is a partial side elevation of the load-storing member, the movable interior parts being indicated in dotted lines; Fig. 5 shows details of attaching means for the various structural parts; and Fig. 6 is a plan view of a portion of the load-storing member, showing details of a latch adapted to retain the load members in position and to release them as described.

The toy comprises two upright members 1, formed from rods or heavy wire, having outwardly bent hooks 2 at their lower ends, connected near their middle portions by two rigid cross members 3 and 4, and having inward bends 5 near their upper ends, and parallel vertical projections 6 above these bends. These projections 6 are adapted to be inserted in guides or sockets 7, fixed to a storage member 8, which is in the form of an open box or trough, slightly inclined from the supports 1.

The base is formed of a metal pan 9, adapted to rest on any plane surface, as shown in Figs. 1, 2 and 3. The rear wall 10 of this pan is straight, diverging to the larger end wall 11, at the middle portion of which is fastened by a rivet 12 a circular metal shell 13 having an open top which is cut away on the side opposite the connection to the base member, and having a curved guiding strip 14 attached inside its outer wall by a rivet 15, for the purpose of leading round weights through the cut-away portion 16 of the shell into the retaining base member 9.

To the base member by means of rivets 17 are pivotally attached diagonal bracing strips 18, each of which at its upper end has a hole 19, with an off-center slot 20 leading thereinto from the edge of the strip, this key-hole slot being adapted to form engagement with the cross member 4 attached to the upright members 1. For this purpose the cross member has in its upper edge notches or cut-away portions 21.

A sheet metal member 22, its edges turned over to stiffen the member, and having key-hole slots 25, as shown in Fig. 5, adapted to engage the cross member 4 at the notches 21, as particularly shown in Fig. 2, is riveted at one end to a load-carrying cylinder or car 24, while at its other end it is joined by a rivet 25 to a counterweight member 26, as shown in Figs. 1 and 3. By this means the member 22 forms a swinging see-saw device, turning about the cross member 4. As shown in Fig. 1, the up-and-down travel of this member is limited by contact of the

cylinder 24 with the receiving member 13 at the bottom, and with trough 8 at the top.

At the middle point of cross member 3 is a hole adapted to be engaged by a terminal eye 27 in a bar member 28, which may be made of wire, and which extends through an opening 29 into and across the bottom of the load-carrying cylinder 24, as shown particularly at the right of Fig. 3, and in Fig. 1.

At the lower end of the trough 8 a portion of the bottom is cut away to form an opening 30. Above this opening and near the end of the box, through the side walls near the top, are holes 31, adapted to form a bearing for a cross member 32 extending across the box and through said holes. Riveted or otherwise fixed to this cross shaft is a depending inverted U-shaped member 33 having its ends turned inwardly to form hooks 34, as shown in Fig. 6. These hooks, or retaining ears, normally extend across the opening 30 in the bottom of the trough, and are adapted to furnish a seat for the spherical members as later described. The shaft 32 at one end extends through the wall of box 8, and is bent downwardly to form a lever or crank arm 35, having an outward extension 36 at its end. The side wall of box 8 is punched outward to form an upper ear 37, and a lower ear 38, extending across the path of travel of the arm 35, and limiting its movement.

Fixed on the outside of the load-carrying member 24 by any suitable means is an upwardly extending arm 39, having an outwardly bent terminal portion 40, adapted to strike the outwardly bent portion 36 of the arm 35, upon travel of the load-carrying member upward, and thereby to raise said arm and consequently the interior latch member above described.

The box 8 is in the form of an inclined trough, or receptacle, and is particularly adapted and intended to receive and store spherical loading members 41, which with the counterweight 26 operate the device, as more fully described hereinafter. It will be understood, however, that various forms of this load-storing member may be adopted and different forms of load members, bullets, marbles, and balls of any heavy material, and that the particular forms described are not a limitation on the construction of the toy.

By the construction illustrated and described, the device is easily assembled, and disassembled, and may be packed in very small space for shipment. The uprights 1 are readily detached from the base member by simply pressing their lower ends inward so as to disengage the hooks 2. Thereafter by tilting the uprights forwardly, the cross member 4 can be disengaged from the key-hole terminal slots of diagonal members 18, leaving the base, the member 13 and the diagonal members free, the diagonal members folding downwardly flat with the base. Then the tilting frame member 22 is readily disengaged from the cross member 4 by turning the swinging member perpendicular to the plane of the uprights and lifting it off said cross bar. The counterweight is of such size that it may be readily withdrawn through the opening between the two cross members and upright members of the frame. The load-storage receptacle lifts off the top of the frame and the toy is then in four parts, all of which are comparatively flat, and which may be advantageously fitted together, or packed in a carton or selling package of comparatively small size.

The operation of the toy is as follows:

Round bodies of considerable weight are placed in the receptacle 8, and owing to the inclined position of this receptacle roll to the lower end thereof, and partly fit into the opening in the bottom of said box, being retained by the hooks 34 forming the terminals of the retaining member 33. These two hooks and the end of the box form a three-point support for the round weights, holding each one as it arrives at the end of the trough accurately in position in the opening 30.

Having thus loaded the toy, the load-carrying member 24 which has been normally held in lower position, is released, and moves rapidly upward, owing to the fact that the counterweight end of the balanced member is arranged to be considerably heavier than the other movable end, when the receptacle 24 is empty. As this member moves upward the terminal 40 of arm 39 strikes the terminal 36 of crank arm 35, driving it upward against the ear 37, and simultaneously moving the retaining hooks 34 backward and upward to a point where they no longer retain the spherical weight suspended, which thereupon drops through the opening 30 into the bucket 24. These round bodies are chosen of such weight that one of them in the member 24 is sufficient to overbalance the counterweight 26 and to cause the load-receiving end of the swinging member to move downward rapidly until it strikes the cylinder 13 with a hammer-like blow. The latch member 28 swings about a center formed by the upper cross member 3, while the load-carrying member swings about cross arm 4 as a center, consequently as and while the load moves downward, the latch 28 is withdrawn from across the bottom of the cup 24, and by the time the position indicated in dotted lines in Fig. 1 is reached, the weight is released, and passes out of the movable member 24 through the shell 13 and into the retaining inclosure

formed by the base member 9. As soon as the load has been thus discharged the counterweight operates to swing the bucket upward, whereupon the next ball which has meanwhile moved down to suspended position, is dropped into it and the operation repeated. By this means the device operates continuously so long as round bodies are fed into the retaining box at the top, the member 24 rising and falling rapidly and striking the bottom with an impact closely simulating the action of a hammer. In fact the whole device is very similar in its operation to that of one form of the commercial trip or helve hammer.

I claim:

1. An automatic toy, comprising a frame, a car mounted on a lever member pivotally attached to said frame, a counterweight for elevating the car, a load receptacle at the upper end of the frame provided with a bottom discharge opening located in position to discharge loads into the car, a gate controlling said opening and arranged to be operated by said car, and a valve in the bottom of the car adapted to be automatically and gradually opened during the descent of the car.

2. An automatic toy, comprising a frame, a lever arm pivotally mounted between its ends in said frame, a load-receiving receptacle at one end of said lever, a counterweight heavier than said receptacle at the other end of the lever, a load-storage receptacle at the upper end of the frame having a discharge opening in the bottom thereof in the path of travel of the load-carrying receptacle, a gate controlling said opening and arranged to be operated by arrival of the receptacle beneath said opening, and means to gradually withdraw a gate controlling the bottom of the car as the car descends.

3. A mechanical toy comprising a frame, a car carried at one end of the lever arm pivotally mounted in said frame and having a counterweight at the other end of said lever arm to move the car upward when empty, a load-storage receptacle at the upper end of the frame inclined therefrom and having a discharge opening in the lower end in the path of travel of the car, a gate controlling said opening and arranged to be operated by arrival of the car thereunder, and a bar member pivoted in said frame above the car-carrying member and extending through the car whereby the load is retained in said car until it reaches the lower limit of its travel.

4. An automatic toy comprising a frame, a car mounted on a lever arm pivotally attached to the frame, a counterweight on the lever arm adapted to raise the car when empty, a receptacle attached to the upper end of the frame and inclined therefrom, a discharge opening at the lower end of said receptacle, a movable gate controlling said opening, a crank arm attached to the gate extending across the path of travel of the car whereby the gate is opened upon arrival of the car at the upper limit of its travel, and means extending across the bottom of the car for retaining a load in position until the car reaches the lower limit of its travel.

5. An automatic toy, comprising a frame, a car mounted on one end of a lever arm pivotally attached to the frame and having a counterweight at the other end adapted to raise the car when empty, an inclined receptacle adapted to retain spherical weights carried at the top of the frame and having a discharge opening at its lower end, a movable gate controlling said opening and adapted to retain the weights stored in the inclined receptacle, means whereby the car operates said gate upon arrival at the upper limit of its travel to release one of the weights, and means to gradually withdraw a gate from the bottom of the car as the car descends.

6. In an automatic toy comprising an upright frame having a receptacle for storing weights, a lever arm pivoted in the frame and having a car at one end adapted to receive weights from said receptacle and a counterweight adapted to raise the car when empty, the combination with the car of a member pivotally attached to the frame at a point above the point of attachment of the car supporting member and extending through the wall of said car and across the bottom thereof, whereby as the car moves downward the cross member is withdrawn to open the bottom of the car.

7. An automatic toy comprising an upright frame, a supporting base member forming a walled inclosure, a weight storing receptacle carried at the top of the upright frame and having a discharge opening in the bottom thereof, a gate controlling said discharge opening and adapted to deliver weights through said opening one at a time, a load-carrying car mounted on a lever arm pivotally attached to the upright frame, a counterweight attached to said lever arm adapted to raise the car when empty, means to operate the gate to deliver a single load member upon arrival of the car underneath the discharge opening, a bar member extending through the car wall across the bottom thereof eccentrically mounted at its other end in the upright frame whereby the bar is withdrawn to open the bottom of the car as the latter moves downward, and a receiving shell adapted to guide the weight members into the retaining base upon arrival of the car at load discharging position.

8. The combination with a toy comprising a pivoted lever arm carrying a counterweight at one end and a load-transporting car at the other, of a bar member pivotally mounted above the pivoted point of the lever arm and having its other end extending through the car wall and across the bottom thereof, whereby as the car moves downward said bar member is withdrawn to allow a load in the car to be discharged.

In testimony whereof I have hereunto set my hand.

BENJAMIN F. BAIN.

Witness:
GLENN H. LERESCHE.