

(No Model.)

A. E. HARKER.
PUZZLE.

No. 513,105.

Patented Jan. 23, 1894.

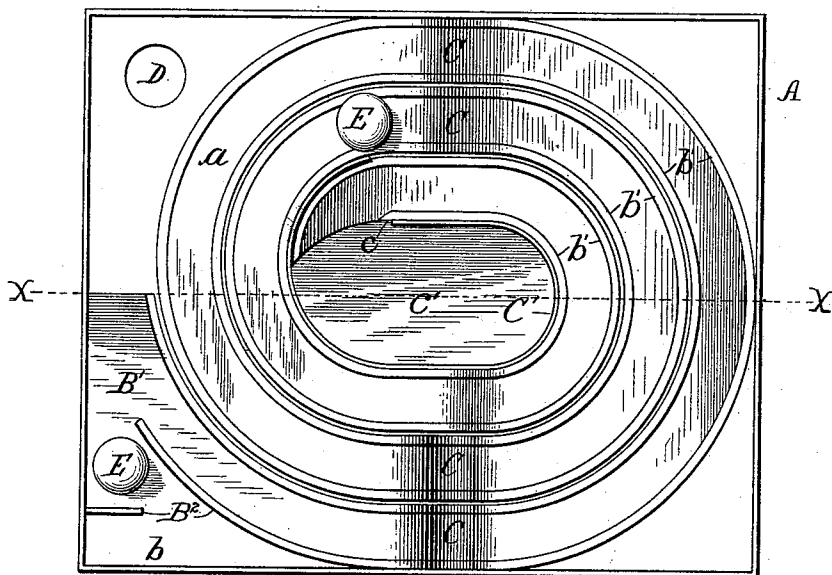


Fig. 1.

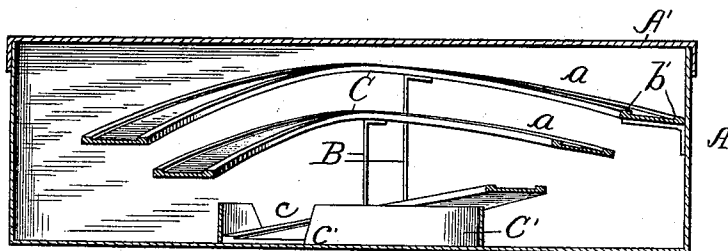


Fig. 2.

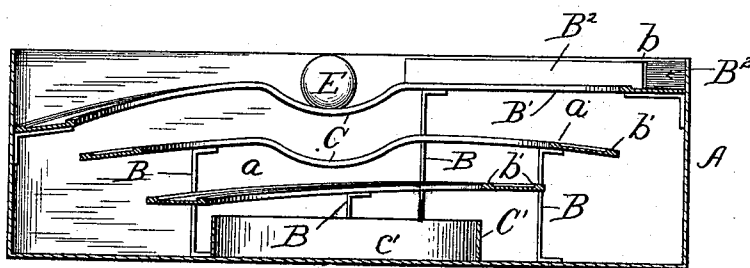


Fig. 3.

Attest
Chas. B. Budge.
[Signature]

Inventor
Albert E. Harker
[Signature]
Attys.

UNITED STATES PATENT OFFICE.

ALBERT E. HARKER, OF HORNERSTOWN, NEW JERSEY.

PUZZLE.

SPECIFICATION forming part of Letters Patent No. 513,105, dated January 23, 1894.

Application filed October 7, 1893. Serial No. 487,454. (No model.)

To all whom it may concern:

Be it known that I, ALBERT E. HARKER, a citizen of the United States, residing at Hornerstown, in the county of Monmouth and State of New Jersey, have invented certain new and useful Improvements in Puzzles; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to that class of puzzles in which balls are made to roll about from one point to another by tilting the box or inclosure containing them.

My object is to provide a device wherein the manipulation of the balls or marbles will be exceedingly difficult and at the same time more fascinating than those hitherto produced. For this purpose I construct an inclosure with a starting point at the top leading to a peculiarly constructed runway which terminates in a goal at the bottom, the main object being to keep the descending ball on the runway until it reaches the goal, all of which will be more fully described hereinafter and pointed out in the claims.

Referring to the accompanying drawings for a more complete description of the invention: Figure 1 represents a plan view thereof. Fig. 2 a section on the line $x-x$ of Fig. 1 and looking to the left of said line, and Fig. 3 a section on the same line and looking to the right thereof.

The puzzle comprises a box or inclosure A, which in the present instance is rectangular in shape, though this is not essential.

Arranged in the box A, is an inclined way a , formed of any preferred material, card or paste-board being, however, regarded as best adapted for the purpose. This way has the general outline of an inverted helix, the convolutions of which are made slightly oblong or elliptical.

The way a , is supported at various points by means of the legs or braces B, which are secured, some to the bottom and some to the sides of the box A, and to the under side of

the way. These devices serve to give the way that degree of rigidity and strength that will be essential. The highest end of the way a , occurs at one corner of the box, preferably the upper left hand corner, and there the way is widened or extended horizontally so as to fit snugly in the corner and thereby form a platform or landing B' , adapted to form the starting place for the balls used in the puzzle. Secured rigidly to this platform are the walls or partitions B^2 , which are preferably two in number and which form the inclosure b , from which the balls are started.

Formed integral with or rigidly secured to the edges of the way a , and extending throughout its length are the flanges or rails b' , which are of such a height that they will barely operate to keep the balls on the way, the slightest lateral force on the balls being sufficient to make them jump the flange. By reference to the sectional views, 2 and 3, it will be seen that the way a , as it curves around the primary ellipse, is formed with a series of sharp depressions and raised portions C, in addition to its gradual rise. These irregularities are formed in order to make the passage of the balls along the way difficult in the extreme and owing to them it will be necessary to agitate and to incline laterally the box which will tend to throw the balls off the way. The positions and intervals of these depressions and raised portions are not necessarily those here shown, for they could obviously be placed anywhere on the way and bear any relation to each other. It is, however, deemed preferable to arrange them as here shown, for by so doing the performance of the puzzle is made as hard as possible.

Arranged within the first curve or ellipse formed by the way a , and on the bottom of the box, is a wall or partition C' , which is curved so as to form an inclosure c' of the same size and shape as the ellipse referred to above, and it is provided with an opening or gate c , which is located directly adjacent to the lower end of the way, so that the balls as they roll down the way may be guided into the inclosure. This inclosure, c' , is adapted to form the home goal or pen and when all the balls are placed therein, after the manner

of the game, the puzzle has been successfully performed. This will appear more fully later on.

5 Formed in one corner of the box A, preferably the upper right hand corner, is a hole or opening D, which is adapted to form an exit for the balls when it is desired to remove them from the bottom of the box.

10 E, represents the balls with which my puzzle is performed and they are of such a size that they may be held between the flanges of the way *a*, and may be formed of any convenient and practicable material.

15 To use the invention the box A, is first taken in the operator's hands and the balls E, placed in the starting inclosure, *b*. The box is then tilted or inclined at various angles and the balls made to roll along the way, the object being to roll all the balls from the inclosure *b*, to the inclosure *c'* via the way *a*, 20 each ball traveling the entire length of the way and without rolling over the flanges or rails *b'*. If the operator is very patient and

his hand steady it is obviously possible to do this, but if the slightest deviation is made, 25 the successful performance will be defeated.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A puzzle comprising a box or inclosure, a 30 strip of material arranged therein and in the form of an inverted helix, the strip being separated from the walls of the box or inclosure excepting at its upper end and supported throughout its length by braces arising 35 from the box, a series of raised portions and depressions formed in the strip at various points throughout its length and a ball adapted to roll along the strip, substantially as described. 40

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT E. HARKER.

Witnesses:

BELLE HARKER,
ROBERT M. IVINS.