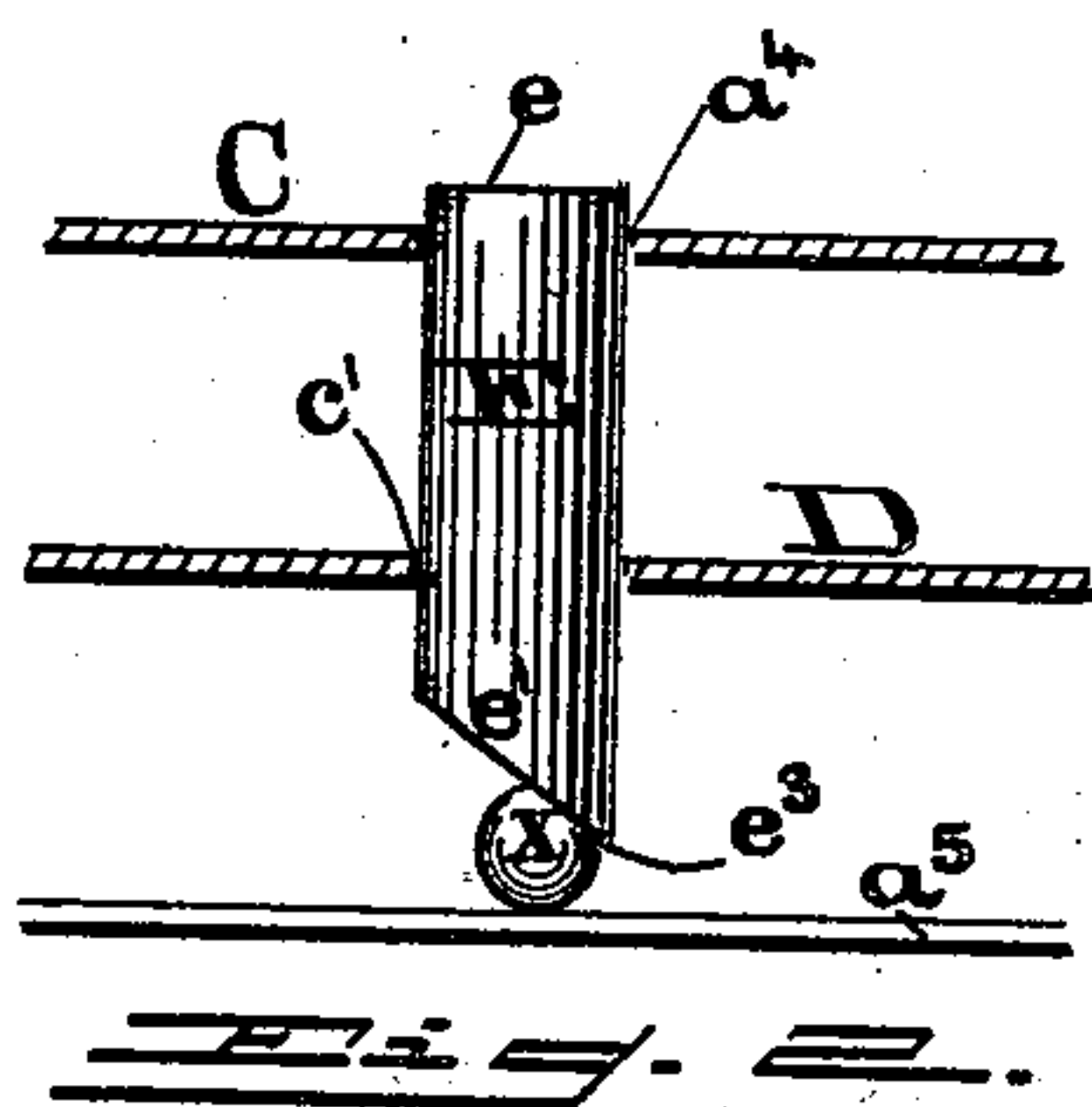
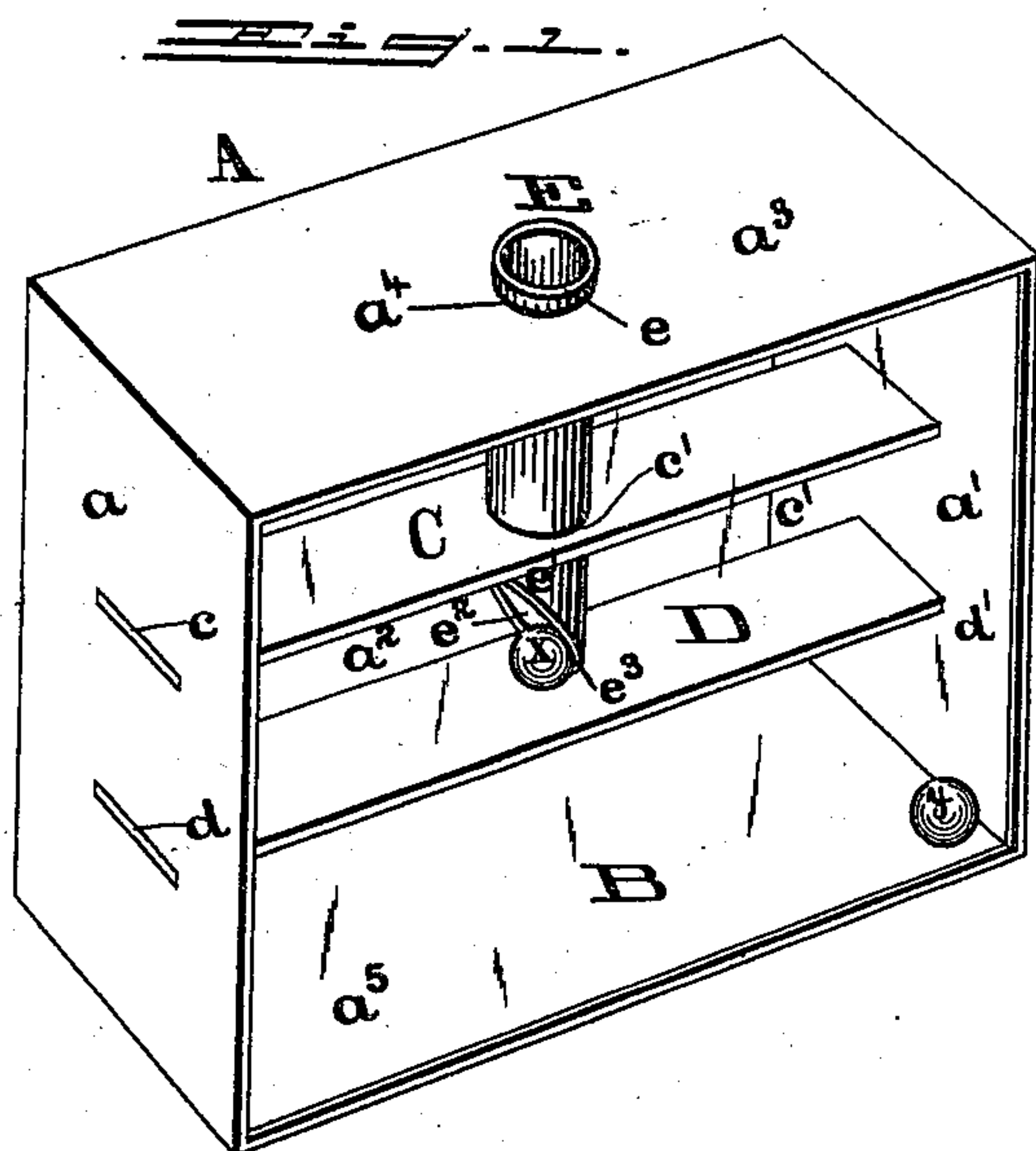


(No Model.)

W. P. GROVES.  
PUZZLE.

No. 504,347.

Patented Sept. 5, 1893.



WITNESSES

*E. H. Powell*  
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INVENTOR

*William P. Groves,*  
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*Wm. S. Powell.*

# UNITED STATES PATENT OFFICE.

WILLIAM P. GROVES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF  
ONE-HALF TO WILLIAM H. GALBRAITH, OF SAME PLACE.

## PUZZLE.

SPECIFICATION forming part of Letters Patent No. 504,347, dated September 5, 1893.

Application filed April 1, 1893. Serial No. 468,683. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM P. GROVES, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Puzzles, of which the following is a specification.

My invention has for its object the provision of a novel and amusing form of puzzle and consists of a box or case, the interior of which is exposed to view, containing a number of movable spheres or balls and having therein a pair of shelves or ledges of a width less than that of the box or case, the spaces between the sides of the latter and the edges of the shelves or ledges affording means of communication, for the balls or spheres, from the different parts of said box or case to said shelves or ledges, said spheres or balls having access to and egress from the inside of the box or case through a tube, one end of which extends to the outside of said box or case and the other end into close relation with one of the shelves or ledges, the object being to ultimately attain the removal of the balls or spheres from the receptacle and, incidentally, to so manipulate the box or case that the spheres or balls, one at a time, will roll onto such ledge or shelf and along the same to the mouth of the tube and, finally, out through the tube, attaining the end desired, which is an operation of more or less difficulty, requiring a very steady hand and considerable manual dexterity.

My invention also consists in the details of construction and the combinations of parts as hereinafter fully described and claimed and as illustrated in the accompanying drawings, wherein—

Figure 1 is a perspective view of the puzzle complete and Fig. 2 an elevation, partly in section and broken away, of a detail, showing the relation of the tube to the shelves and the top of the box or case.

In said drawings, the box A, in which are contained the balls  $x$   $y$ , (of which there may be any number other than that shown), is provided with a transparent front B and has therein the shelves or ledges CD located one above the other and sustained in such relation through having their tenoned ends  $c$   $d$

fitted into corresponding mortises in the ends  $a$   $a'$ , said shelves being of less width than the ends of the box, leaving spaces  $c'$   $d'$  between their edges and the front B and back  $a^2$  of said box. The top  $a^3$  of the latter has a circular opening  $a^4$  therein, as has, also, the upper shelf or ledge C, as at  $c'$ , permitting the tube E to be inserted and secured in said openings, with its end  $e$  projecting slightly beyond the plane of the outside of the top  $a^3$  and its lower end  $e'$  in close relation with the lower shelf or ledge D, the end  $e'$ , as shown, being planed or finished off at an incline or an angle with the axis of the tube, forming an upwardly extending opening  $e^2$  in, as it were, the side of said tube and which faces toward one end of the shelf or ledge last mentioned.

In order to get the ball  $y$  to the point at which is located the ball  $x$ , the box A, for example, should first be tilted so as to cause the ball to run on the bottom  $a^5$  to the end  $a$  and then turned until said end is horizontal and forms a run-way for said ball. Now the box is poised and tilted in such manner that said ball will pass through one or the other of the spaces  $c'$   $d'$  and between the shelves or ledges, resting against the lower one D, whereupon the box is restored to the position shown in Fig. 1 and so manipulated as to cause the ball to roll on said shelf until it strikes the lowermost portion  $e^3$  of the tube-opening  $e^2$ , when the tilting of the box in the proper direction will cause such ball to pass through the tube E to the outside.

As is quite obvious, the movements of the box A for the attainment of the end desired are many and various and require great nicety and precision, particularly those necessary for causing the balls which are, in practice, of lead and difficult to control, to roll between the shelves and no farther, (there being nothing to prevent their rolling clear across to the other side,) and then roll on the lower shelf into the opening  $e^2$  of the tube E, which shelf is very little wider than the tube and the slightest deviation from the horizontal plane will cause said balls to roll off, as they most frequently do, this feat being rendered more difficult by the presence of the shelf C, which bars a direct passage of the



balls from the top of the box or case to the shelf D.

What I claim as my invention is as follows:

1. In a puzzle, the combination of a box or case, having its interior exposed to view, containing a number of movable spheres or balls, and having therein a shelf or ledge, and a tube extending outside the box or case and having an end adjacent to the shelf or ledge, substantially as specified.

2. In a puzzle, the combination of a box or case, having its interior exposed to view, containing a number of movable spheres or balls, and having therein a shelf or ledge, and a tube extending outside the box or case and having an end adjacent to the shelf or ledge and provided with an opening whose plane is at an angle with the axis of the tube and which faces toward one end of said shelf or ledge, substantially as specified.

3. In a puzzle, the combination of a box or case, having its interior exposed to view, containing a number of movable spheres or balls, and having therein a shelf or ledge, and a tube extending outside the box or case and having an end adjacent to the shelf or ledge and provided with an opening whose plane is at an angle with the axis of the tube and which faces toward one end of said shelf or ledge, the lowermost portion of such end being a less distance from the shelf or ledge than is represented by the diameter of the spheres or balls, substantially as specified.

4. In a puzzle, the combination of a box or case, having its interior exposed to view, containing a number of movable spheres or balls, and having secured therein and to the ends thereof a pair of shelves or ledges located one above the other, and a tube extending from the outside of the box or case, through the

upper and into close relation with the lower one of said shelves or ledges, substantially as specified.

5. In a puzzle, the combination of a box or case, having its interior exposed to view, containing a number of movable spheres or balls and having secured therein and to the ends thereof a pair of shelves or ledges located one above the other, and a tube extending from the outside of the box or case, through the upper and having an end adjacent to the lower one of said shelves or ledges, such end being provided with an opening whose plane is at an angle with the axis of the tube and which faces toward one end of the shelf or ledge last mentioned, substantially as specified.

6. In a puzzle, the combination of a box or case, having its interior exposed to view, containing a number of movable spheres or balls and having secured therein and to the ends thereof a pair of shelves or ledges located one above the other, and a tube extending from the outside of the box or case, through the upper and having an end adjacent to the lower one of said shelves or ledges, such end being provided with an opening whose plane is at an angle with the axis of the tube and which faces toward one end of the shelf or ledge last mentioned, the lowermost portion of such end being a less distance from such shelf or ledge than is represented by the diameter of the spheres or balls, substantially as specified.

In testimony whereof I have hereunto set my hand this 29th day of March, A. D. 1893.

WILLIAM P. GROVES.

Witnesses:

R. DALE SPARHAWK,  
WM. H. POWELL.