

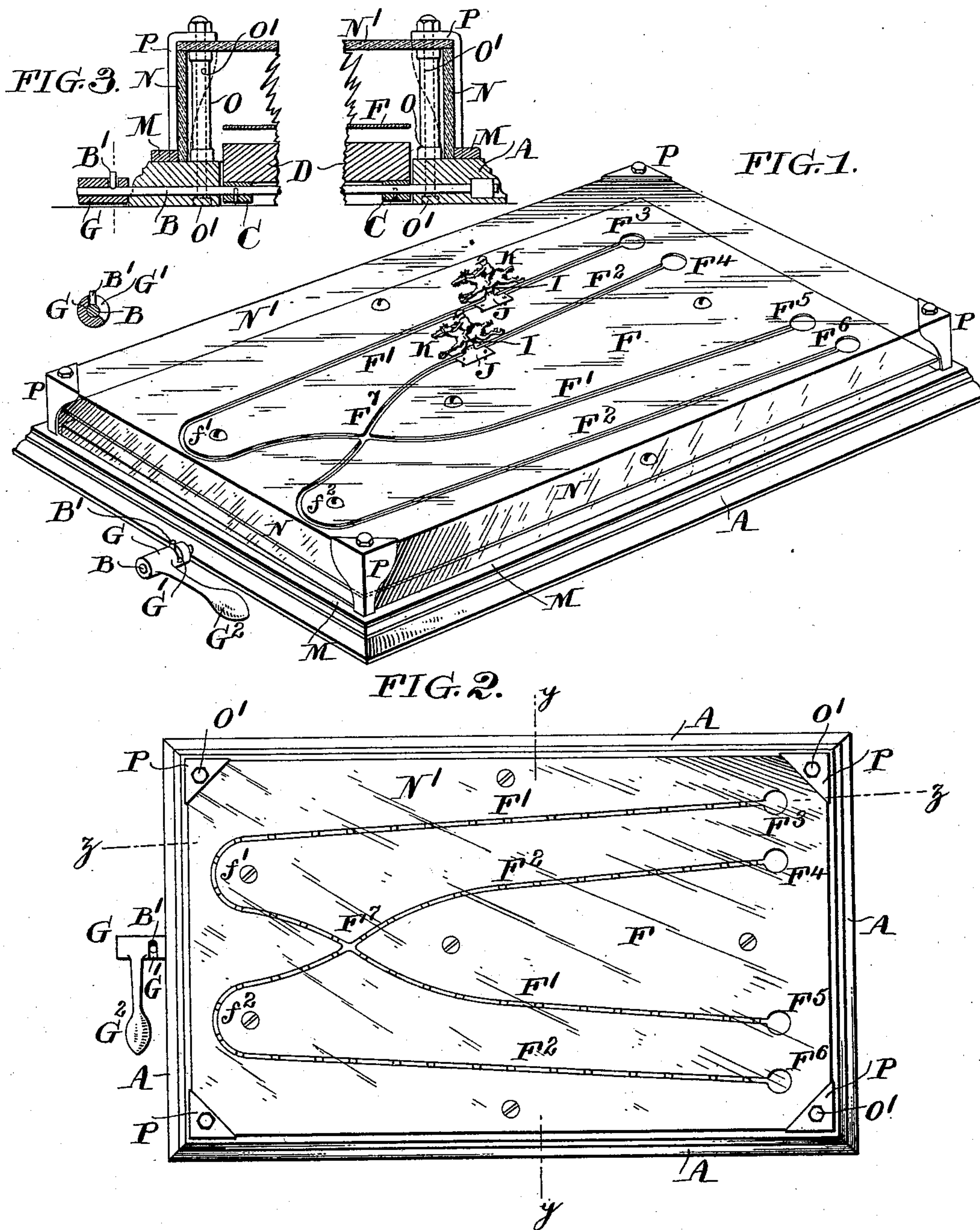
(No Model.)

2 Sheets—Sheet 1.

S. H. HARRINGTON.
TOY.

No. 588,988.

Patented Aug. 31, 1897.



WITNESSES:

Henry D. Dwyer
H. J. Pack

INVENTOR:

Samuel H. Harrington
by his atty
James T. Chambers

(No Model.)

2 Sheets—Sheet 2.

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FIG. 4.

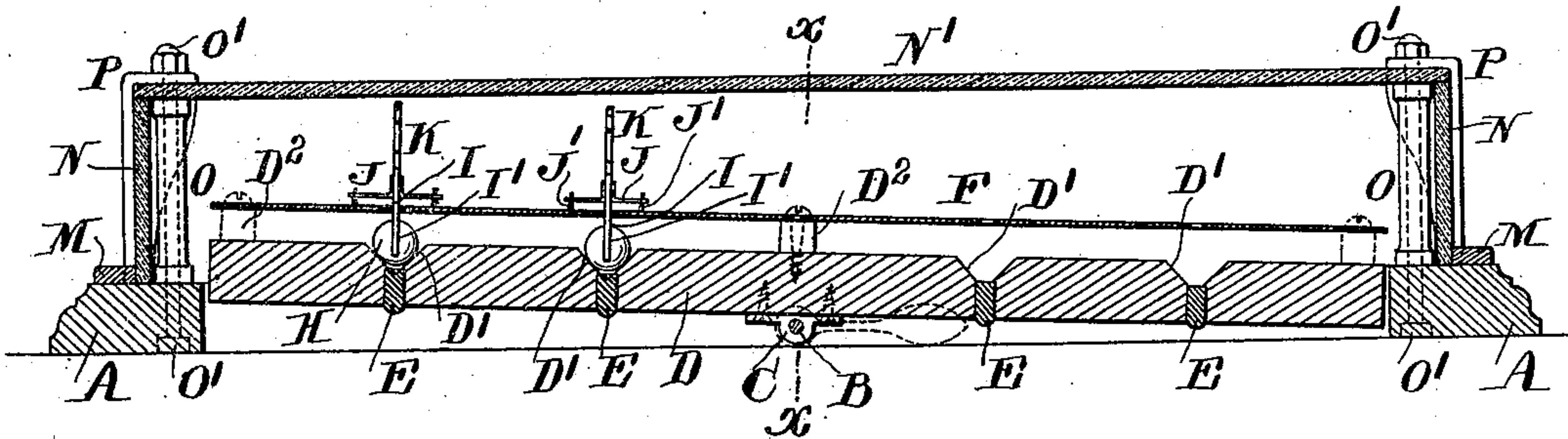


FIG. 5.

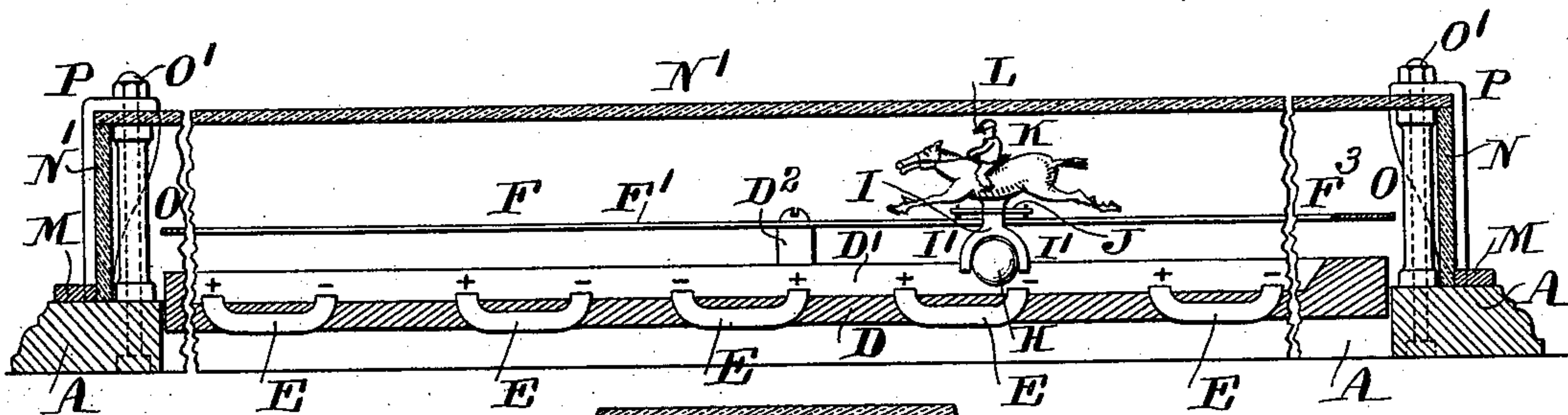


FIG. 6.

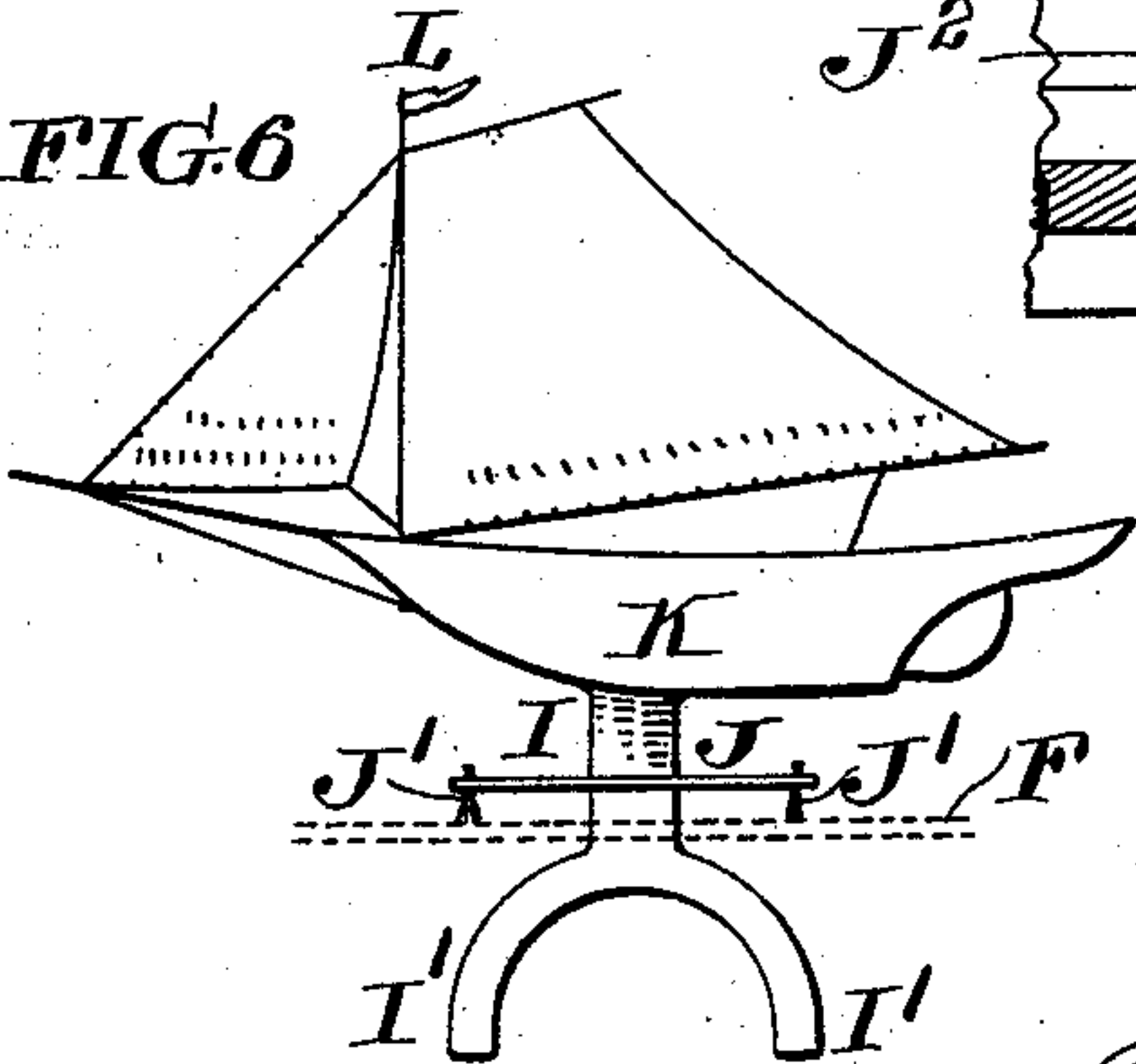


FIG. 9.

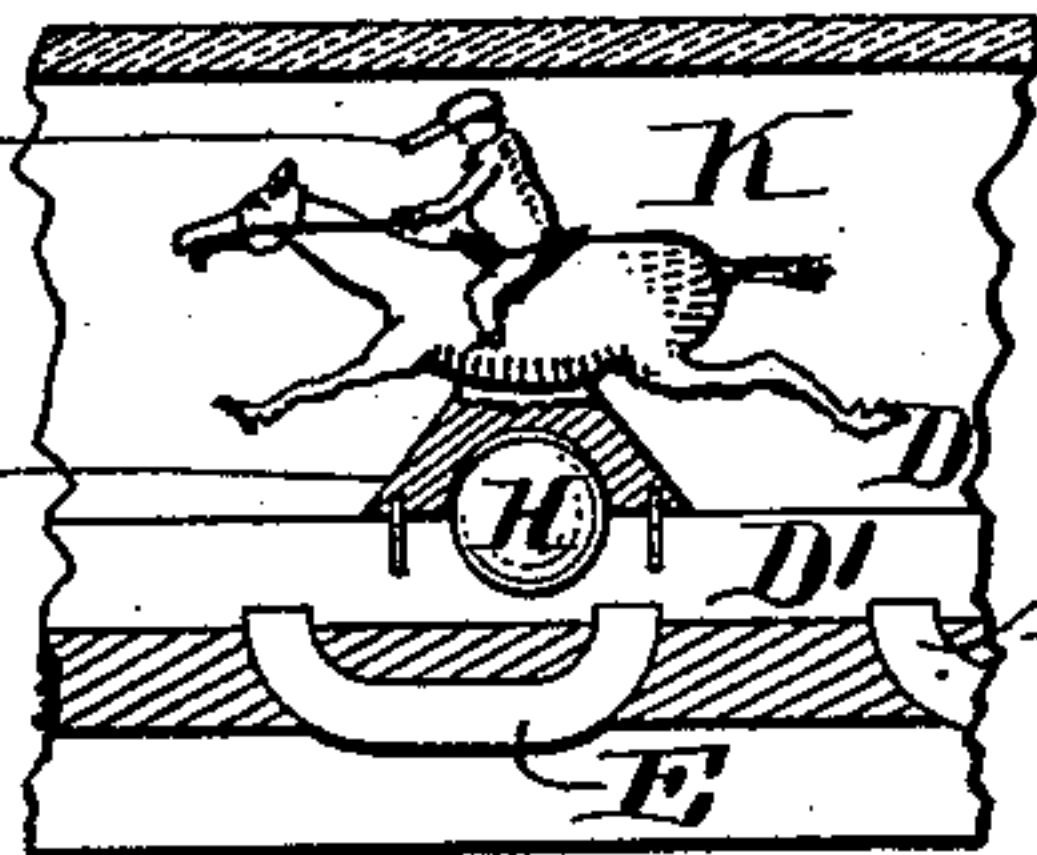


FIG. 8.

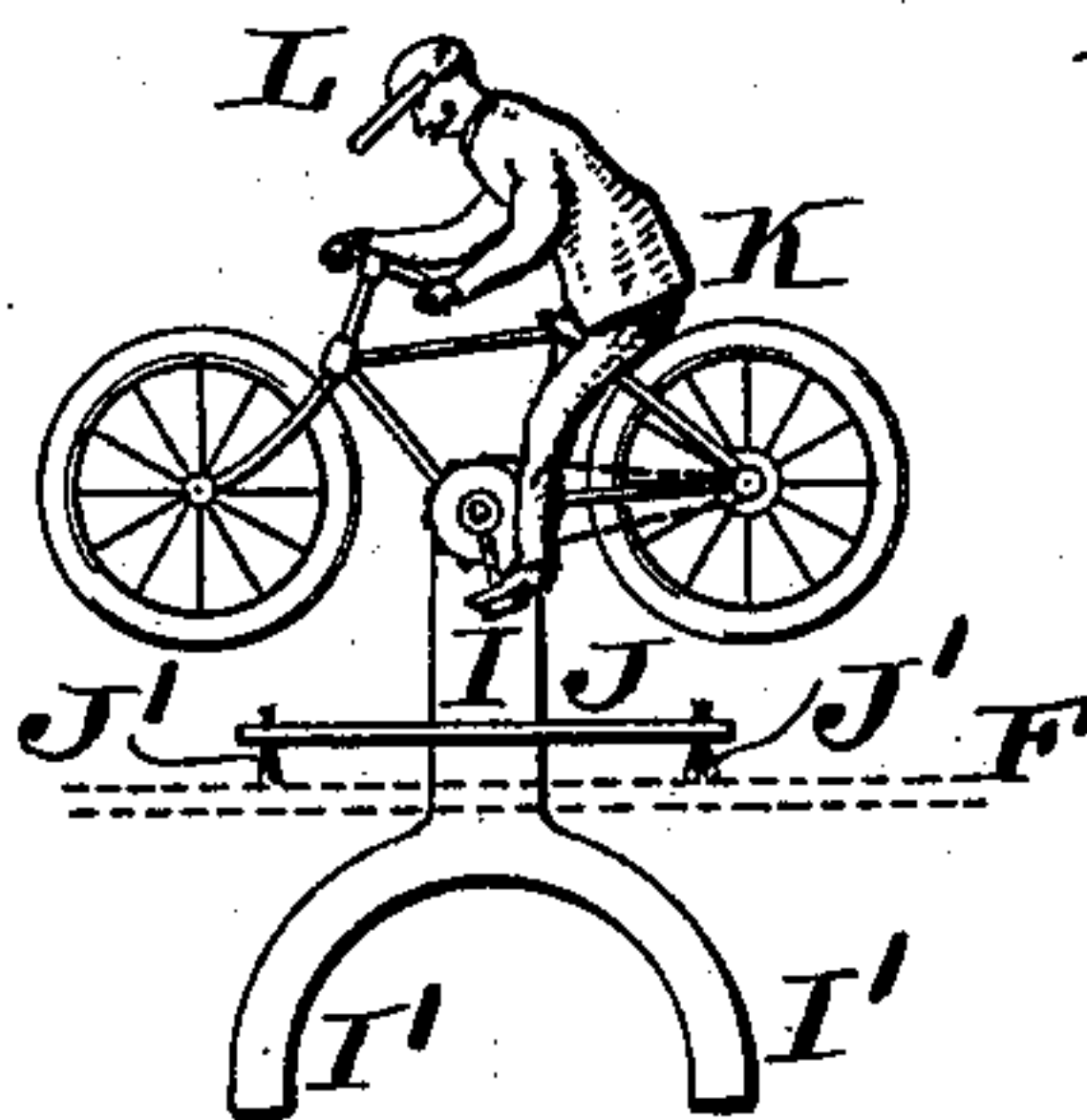


FIG. 7.

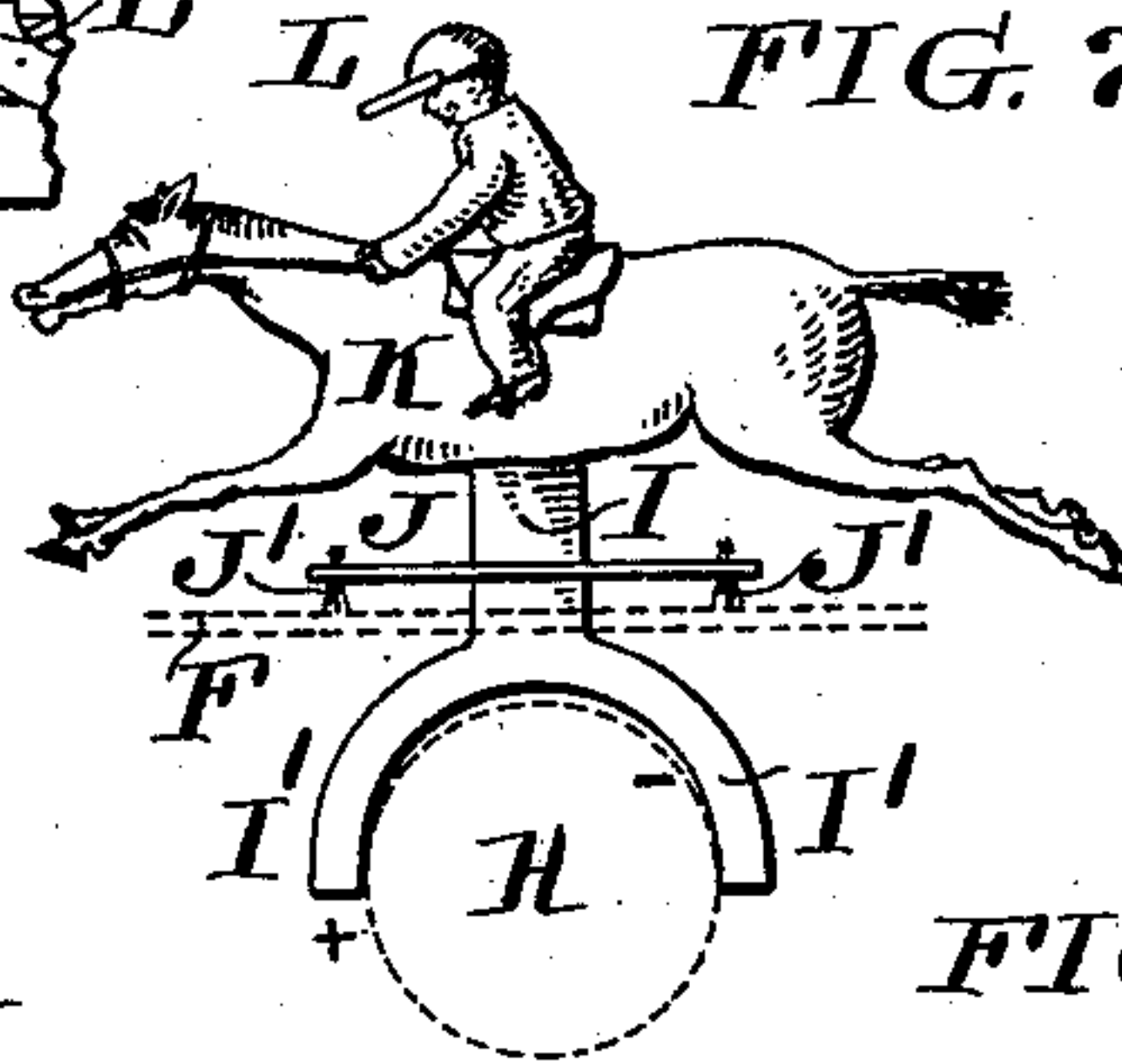
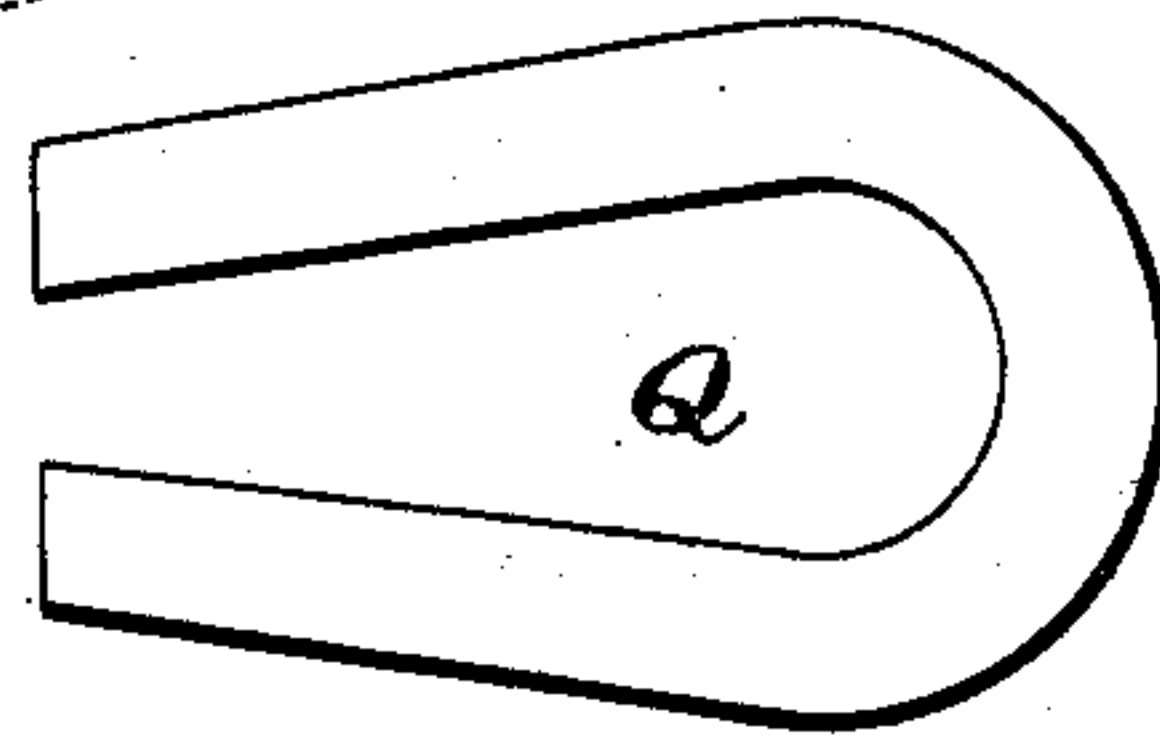


FIG. 10.



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UNITED STATES PATENT OFFICE.

SAMUEL H. HARRINGTON, OF PHILADELPHIA, PENNSYLVANIA.

TOY.

SPECIFICATION forming part of Letters Patent No. 588,988, dated August 31, 1897.

Application filed May 25, 1895. Serial No. 550,611. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL H. HARRINGTON, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a certain new and Improved Toy, of which the following specification is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to the construction of a toy, and has for its object to provide a toy in which movable figures are made to move at the same time in such a way as to present the appearance of a race between them, and preferably under conditions affecting their relative rates of speed, which are constantly changing.

The nature of my invention will be best understood as described in connection with the drawings, in which it is illustrated and in which—

Figure 1 is a perspective view of my toy as a whole; Fig. 2, a plan view of the same, omitting the movable figures; Fig. 3, a cross-section on the line $x x$ of Fig. 4 with the center broken away; Fig. 4, a cross-section on the line $y y$ of Fig. 2; Fig. 5, a cross-section on the line $z z$ of Fig. 2; Figs. 6, 7, and 8, side views of the figures such as are adapted for use in connection with my toy; Fig. 9, a view illustrating a modification of construction, and Fig. 10 a plan view of a horseshoe-magnet adapted for use in connection with my toy in the way to be hereinafter described.

A indicates the base upon which the toy is supported, and which is here indicated as a rectangular molding.

B is a shaft journaled in the base A, and, as shown, secured to brackets C, which in turn are fastened to a board D, said board being substantially balanced on the shaft B and free to turn on it in either direction through a slight arc, and so as to incline the board either in one direction or the other. On the upper face of the board D, I form a number of grooves, (indicated at D'), and which may be of any desired number. These grooves are formed in such a way that when the board is tilted in either direction a ball lying in the groove will tend to roll from the upper to the lower ends of the grooves. They should be of

substantially equal length, and the inclination of each groove should be as a whole substantially equal to the inclination of each other groove, although the inclination at various parts of the length may be substantially different from the inclination of the corresponding parts of the other grooves. I prefer to form the grooves so that they will run from one side of the board across to the other and back to the original side, and when so constructed it is desirable that the grooves should cross each other, and, to prevent the liability of collisions at the point of crossing, I make such crossing-point occur at different distances from the ends of the grooves, as is indicated in Fig. 1, where the grooves F' and F^2 , which correspond precisely to the grooves D' , are shown as crossing each other at the point F^7 , and I will here state that I prefer in all cases to secure above the board D a platform F, which moves with the board D and is provided with the slots F' and F^2 , lying directly above the grooves D' of the board. A slot F' extends from F^3 across the board, turning at f' to the point F^5 on the same side of the board as F^3 , while the slot F^2 extends from the point F^4 across the board, turning at f^2 to the point F^6 on the same side of the board as the points F^4 and F^3 . The ends of the slots F' and F^2 are enlarged, as shown at F^3 , F^4 , F^5 , and F^6 , for the purpose of permitting the clutch extension which will be hereinafter described to turn thereon.

Preferably I secure in the bottoms of the slots D' a series of magnets, as indicated at E E, &c. These magnets may be most conveniently permanent magnets, though of course electromagnets might take their place.

H H indicate balls or rollers adapted to lie in the grooves D' and to roll from one end to the other of such grooves when the board D is tilted. They are preferably made entirely spherical and magnetized, so that each ball will be a permanent magnet having a positive and a negative pole.

G indicates the hub of a weight or handle. The hub fits loosely on the end of the shaft B and is provided with a slot G' , into which extends a pin B' from the shaft B. The slot G' is of such dimensions and arrangement that as the weighted handle G^2 is thrown

from one side of a vertical line to the other it will engage the pin B' and tip the board D through the desired arc at each movement of the handle, the weight of the handle being
 5 sufficient to move the board and hold it in the desired position until the balls have moved from the upper to the lower ends of the slots.

K K, &c., indicate light figures representing any objects—such as horses, yachts, bicycles, &c.—and, as shown in all figures except Fig. 9, each is provided with a depending clutch-arm I, adapted to extend through the slots F' or F², and having at its lower extremity a clutch I', which is adapted to engage one of the balls II, lying in the groove below the slot through which the clutch-arm extends. It is desirable that the weight of the clutch and the figure supported by it
 20 should not rest upon the ball, and therefore I preferably secure to the clutch-arms I a little platform or extension J, which extends to each side of the slot in the platform F and by which the weight of the figure and the
 25 clutch is supported on such platform, preferably through a few bristles, as indicated at J'.

I have found it advisable to construct the platform F and the clutch and clutch-arms
 30 of celluloid, as being both light and smooth; but any smooth material may be used for the platform, and obviously a great many materials could be used for the formation of the clutch.

The use of the platform F is not essential, as the figures may be supported directly upon the board D, as indicated in Fig. 9, in which I have shown the figure K as supported upon a conical clutch J², which rests
 40 upon the board D, spanning the groove D' and inclosing the top of a ball II.

Preferably I inclose the upper part of my game-board in a glass casing, which, as shown, is made up of side pieces N and the top plate
 45 N'. The side pieces rest at the bottom against a molding or bead M and against upright pillars O, situated at the inside of the corners and through which pass bolts O'. Metal clips P extend over the outside of each corner and
 50 are held in place by recesses in the beads M and by the upper end of the bolt O', as indicated in the drawings. The top plate N' should lie quite close to the tops of the figures K, and near the upper part of each figure I secure a permanent magnet L, the purpose of which will be hereinafter described.

The operation of the toy is as follows: Each figure being at the corresponding end of its appropriate groove and slot and each
 60 ball of course lying in the groove immediately below the figure, the board D is tilted in the proper direction and the balls II at once begin to roll through the downwardly-inclined slots, carrying with them the figures K, which
 65 are thus given the appearance of racing with each other, the movement continuing until

the balls reach the lower ends of the slots. The reason for which I enlarge the ends of the slots and provide each figure with a permanent magnet L at its upper end is to enable the figures to be turned, so that when
 70 they have reached the lower ends of the slots and grooves they can be pointed backward so as to run forward when the board is tilted in the opposite direction. The enlargement
 75 of the ends of the slots permits the clutch-arms to turn at this point, and the figures being very light the turning can be effected without touching them by means of a horse-shoe-magnet, such as Q, Fig. 10, acting upon
 80 the permanent magnets L through the glass plate N'.

The operation of the magnets E and the magnetized balls II is to introduce an element by which the movement of the balls
 85 will be accelerated or checked a great number of times as they roll through the grooves and under conditions which are constantly varying. This depends upon the fact that like poles of two magnets repel and unlike poles
 90 attract each other. Consequently the balls as they move over the poles of the magnet E are sometimes checked and sometimes accelerated, and the balls being of spherical shape it is practically impossible that they should
 95 ever present themselves twice to the poles of the stationary magnets in the same way. Therefore an element of great uncertainty is introduced into the movement of the figures controlled by the balls and the interest of the
 100 toy thereby materially increased.

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

1. A toy having in combination a board having two or more grooves in its face, a series of magnets situated in the grooves, magnetized balls or their equivalents adapted to roll in said grooves, and light figures adapted to engage the balls as described so as to move
 105 over the board as the balls roll in the grooves thereof.

2. A toy having in combination a board having two or more grooves in its face, a series of magnets situated in the grooves, magnetized balls or their equivalents adapted to roll in said grooves, and light figures resting on or above the surfaces of the board and having dependent clutches adapted to engage the balls in the grooves and so that the movement of said balls will cause the figures to move over the board.

3. A toy having in combination a board having two or more grooves in its face, balls or their equivalents adapted to roll in said
 125 grooves, a platform secured above the board and having slots through it corresponding with the grooves in the board, said slots being enlarged at their ends so as to permit the clutches to turn therein, light figures supported on the platform, magnets secured to
 130 the upper parts of said figures, clutches ex-

tending from said figures through the slots in the platform to engage the balls, and a glass case inclosing the platform and figures supported thereon.

- 5 4. In a toy substantially as described the combination of the slotted board D with a shaft B upon which it is substantially balanced, and a weight G^2 adapted to move to

either side of a vertical line and to engage and move the shaft and board through a de- 10
termined arc in either direction.

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Witnesses:

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