(No Model.) 5 Sheets—Sheet 1.

# A. M. COYLE.

## AUTOMATIC RACE COURSE.

No. 425,370. Patented Apr. 8, 1890.

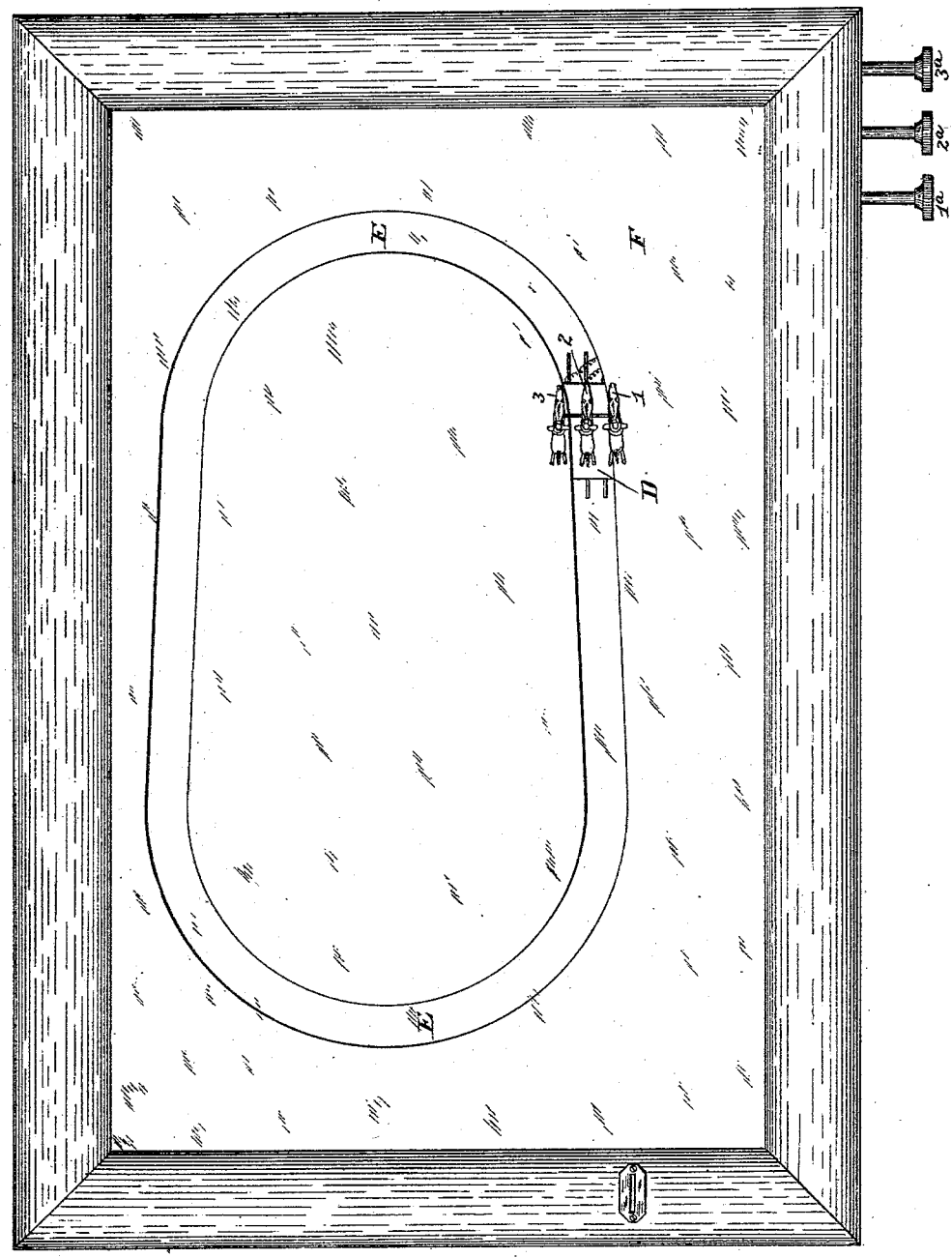



FIG 1.

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## AUTOMATIC RACE COURSE.

No. 425,370. Patented Apr. 8, 1890.

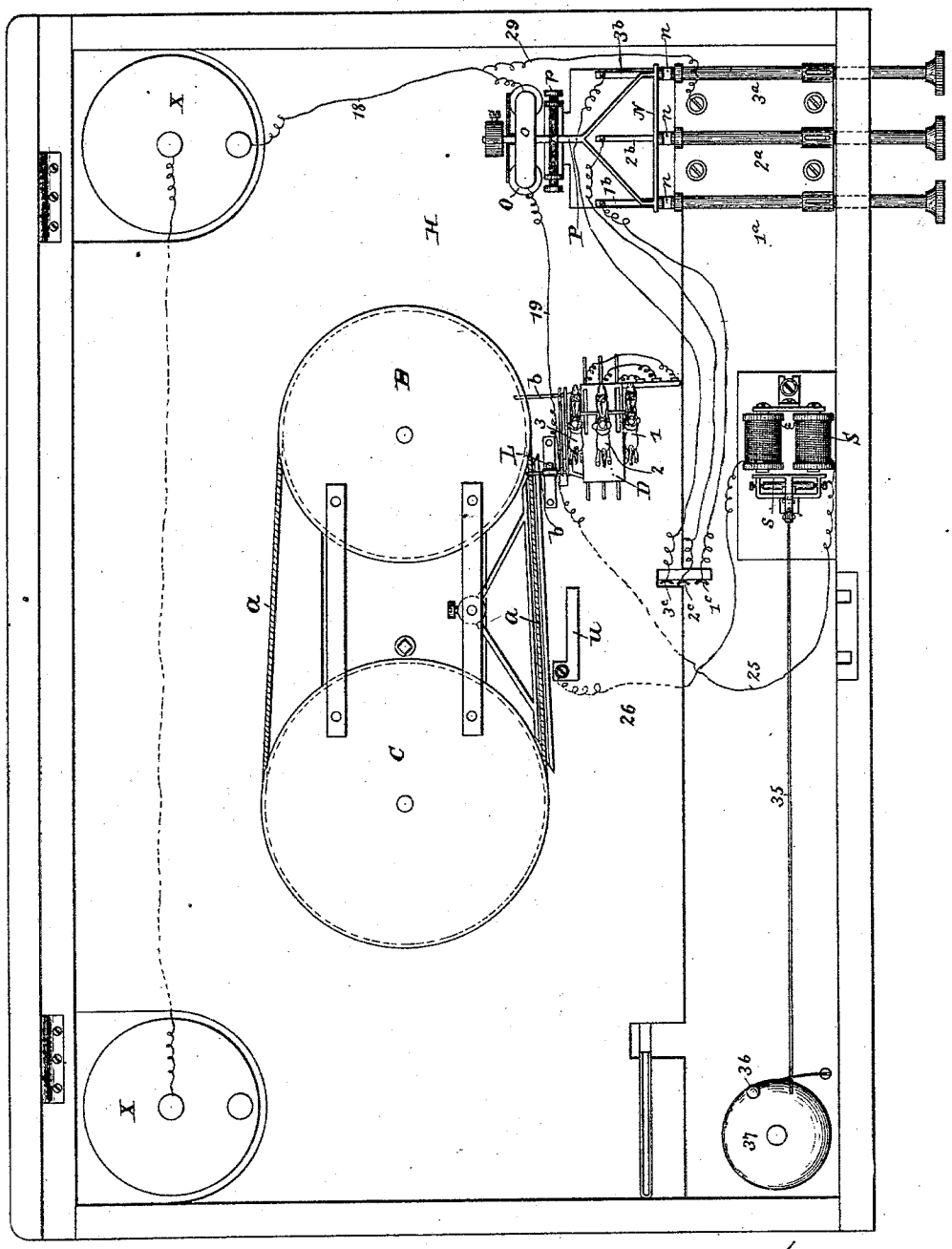



FIG. II.

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## AUTOMATIC RACE COURSE.

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FIG. III.

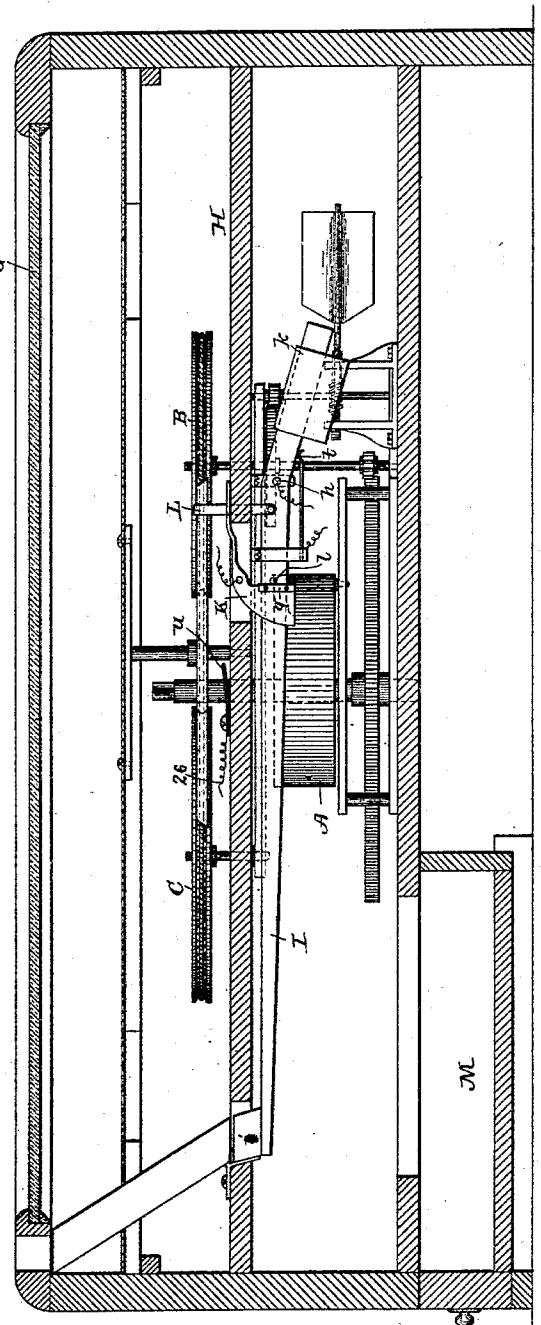
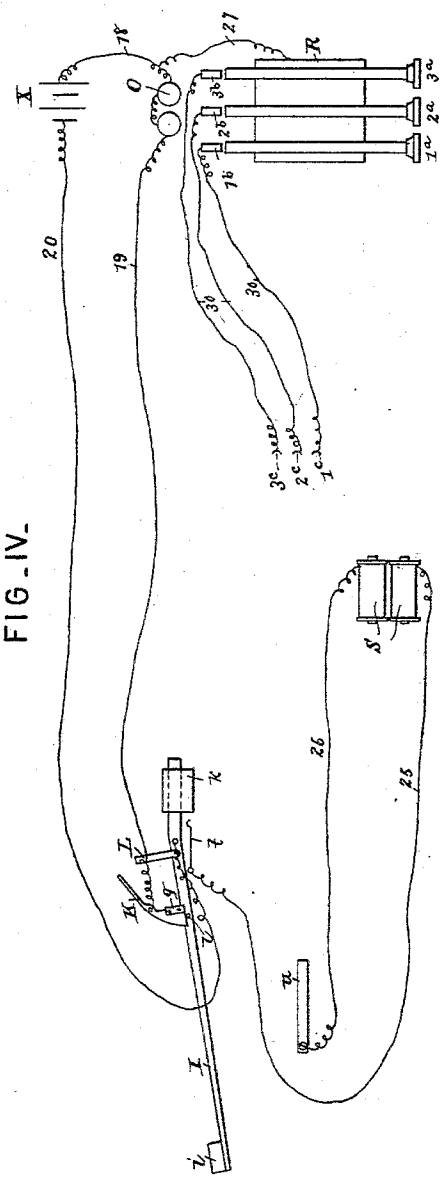



FIG. IV.




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## AUTOMATIC RACE COURSE.

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FIG. V.

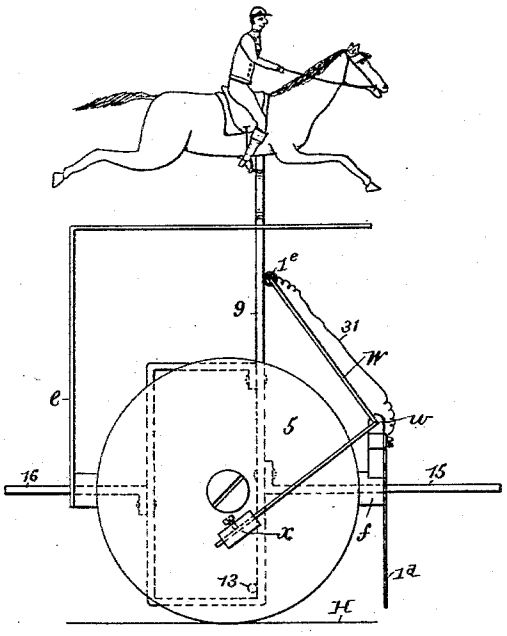



FIG. VI.

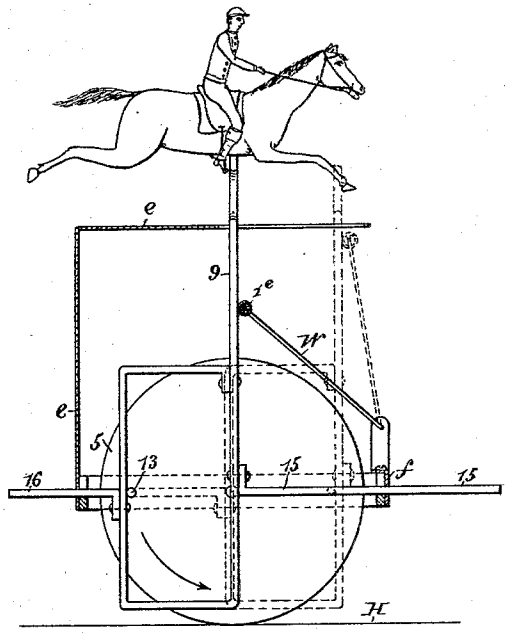



FIG. VII.

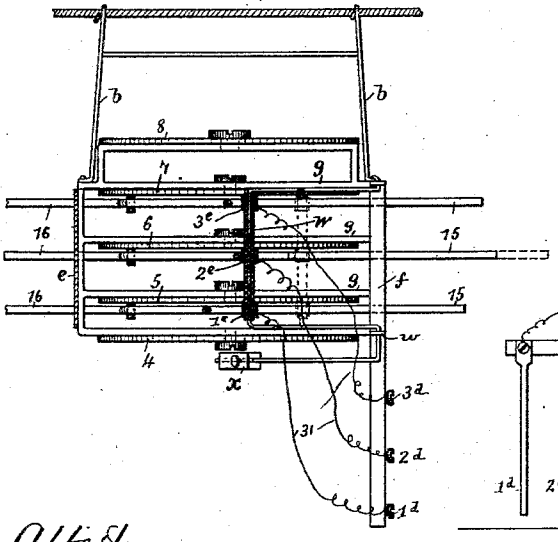
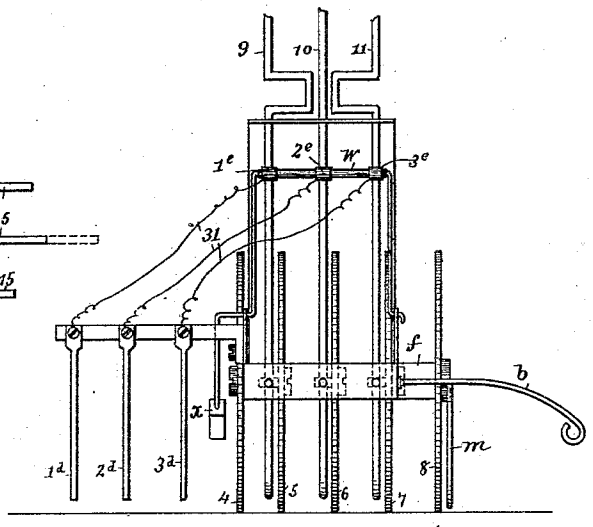



FIG. VIII.




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## AUTOMATIC RACE COURSE.

No. 425,370. Patented Apr. 8, 1890.

FIG. IX.

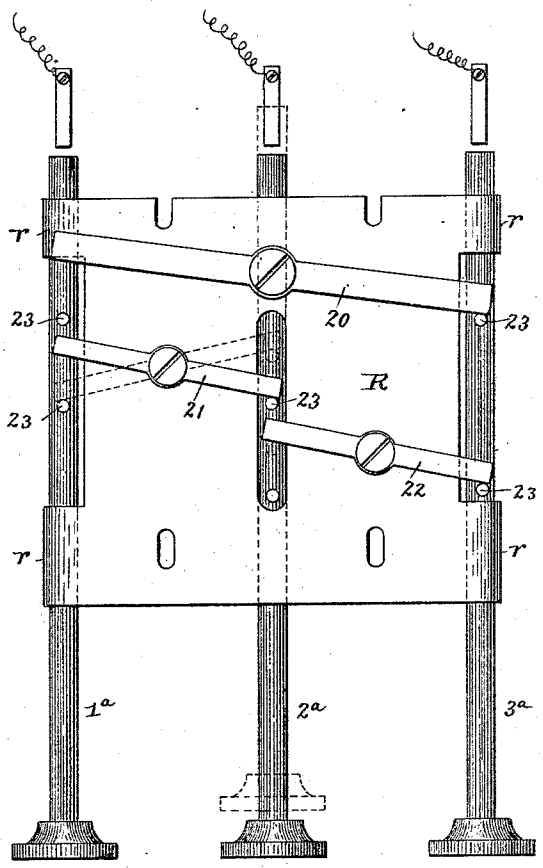
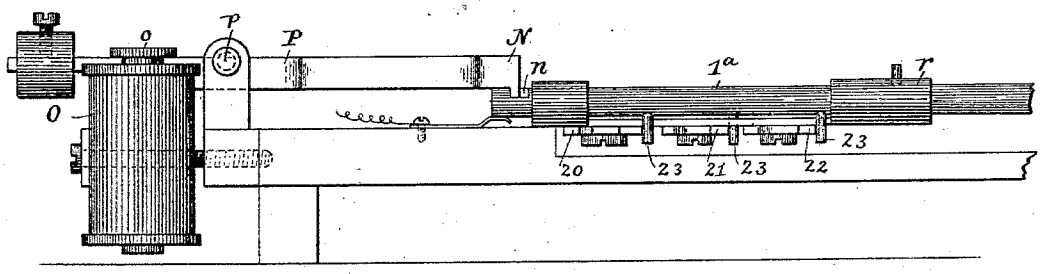



FIG. X.




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# UNITED STATES PATENT OFFICE.

ANDREW M. COYLE, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO JOHN C. EDWARDS, OF SAME PLACE.

## AUTOMATIC RACE-COURSE.

SPECIFICATION forming part of Letters Patent No. 425,370, dated April 8, 1890.

Application filed January 13, 1890. Serial No. 336,822. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW M. COYLE, of Washington, in the District of Columbia, have invented a new and useful Improvement in Automatic Race-Courses, which improvement is fully set forth in the following specification.

This invention has reference to the construction of a "roundabout" or toy apparatus, wherein a number of moving figures, of which horses may be taken as the type, run together around a track or course, the figures being set in motion by the deposit of a coin, though the invention or a greater portion thereof may be employed with other means for starting the racers in motion.

With reference more particularly to the movements of the racing figures, it is essential, in order to maintain an interest in the toy, that the result of the race should be an uncertainty, and that in all cases each one of the horses (or other figures that may be represented) should have an even chance of being first at the goal. To subserve the same purpose, it is also desirable that the rate of motion of the racers should be somewhat proportional to the miniature track upon which they run, or, in other words, that the time of the race should be something approximate to that usually consumed in an ordinary horse-race, and that the several racers should shift positions from time to time as they circle around the track, thus presenting as nearly as possible the actual conditions and incidents of a veritable horse-race. These objects have been kept in view in carrying out the present invention.

The invention includes, further, a selecting mechanism whereby the user of the apparatus for the time being can select one of the racers as the probable winner and indicate his choice. A simple mechanism for this purpose consists of a series of keys or push-knobs, one for each of the racing figures, the user having the privilege of depressing any one of these keys or knobs at or for a short time after the figures start into motion. With the selecting mechanism is combined locking mechanism, whereby after the figures have moved over a certain portion of the course (say half the distance) the keys are locked in position and cannot be disturbed during the remainder of the race.

The invention also includes the combination, with the selecting mechanism, of indicating mechanism, (which may be of various sorts,) which is adapted to respond in the event of the user's having selected the winning horse and in no other. This indicating mechanism may be arranged to deliver a prize, to ring a bell, to display a flag, or to perform any one or more of a number of simple mechanical operations which are now common in coin-controlled apparatus of various sorts.

The manner in which the invention is or may be carried out will now be described in detail in connection with the accompanying drawings, in which—

Figure I is a top view of a box or case, showing the track and racers in their starting position. Fig. II is a plan view of parts beneath the track. Fig. III is a longitudinal vertical section. Fig. IV is a diagram illustrating the electric circuits and connections. Figs. V, VI, VII, and VIII are detail views illustrating the carriage and mounting of the horses; and Figs. IX and X are details of the selecting mechanism.

Power is furnished by a clock-work, (shown at A, Fig. III,) which drives the wheel B, which in turn imparts motion to the companion wheel C through a cord *a*. The racer-carriage D is attached to this cord by links or wires *b*, whereby the racers are carried around the oval track or course E. The wheels B C and other mechanism are concealed by the plate F, which forms the plane of the race-course. The three miniature horses 1, 2, and 3 project slightly above this plane. A glass plate G covers the whole.

The horses 1 2 3 (and the number may be greater or less than three) are all mounted on the same carriage D, so that they move together. This carriage is composed of a plate *e* of thin metal bent at a right angle and forming the top and back, a front plate *f*, and horizontal side and intermediate strips *g*. (See Figs. V to VIII.) To these strips *g* are journaled a series of wheels 4, 5, 6, 7, and

8, capable of independent rotation. The number of these wheels is immaterial, but there must be at least one for each racer. As shown, there are two extra wheels.

Each horse or racing figure is mounted on a rod 9, 10, or 11, which rods pass up through slots in plate *e*, so that the horses can move back or forward with respect to their carriage in addition to their common motion with said carriage. The rod 9, Figs. V and VII, passing down, is bent to form a rectangular frame alongside of its wheel 5, and an eccentric-pin 13 on this wheel works within the frame, and as said wheel rotates strikes now at the forward side of the rectangle and now at its rear side. From the rectangular part of rod 9 a rod 15 projects forward through a guide-opening in plate *f*, and a rod 16 projects backward through a similar guide-hole in plate *e*. By these arrangements the horse is supported so that it can slide readily forward and back. Each of the other rods 10 and 11 is constructed in precisely the same manner. Thus when the carriage and racers are dragged around by the cord *a* the wheels 5 6 7, running on board H, are rotated by friction, and the eccentric-pins 13, striking first one way and then the other, intermittently accelerate and retard the horses, respectively, causing them to shift their positions, as in an ordinary race, and making it a matter of uncertainty which horse will be in advance when the goal is reached.

The starting and stopping of the figures is effected by the coin-operated lever I, Figs. III and IV, which is pivoted at *h*, and is provided with the usual coin receptacle or basket *i* and with a counter-weight *k*. Alongside of the coin-lever I in a slot of board H is provided the latch K, its end lying flat against board H, being held in this position by the pin *l* on coin-lever I. The said lever I also carries an upright stop L, which arrests and holds the carriage, as shown in Fig. II. When a coin by its weight depresses the coin-lever I, this stop L is withdrawn from the path of the carriage, which at once begins to move around the track. The pin *l* also moves away from latch K, which thereupon tilts by gravity, its small end flying up, as shown in Fig. IV. When the coin falls out of the coin-basket *i* into the receptacle or drawer M, the counter-weight *k* raises the lever I; but the latter cannot return to its normal position, because, as shown in Fig. IV, pin *l* strikes against the under side of latch K. When the carriage and racing figures complete the circuit, a brush *m*, Fig. VIII, passes over latch K and depresses it, allowing lever I to swing back to its normal position; but the carriage has before this passed the stop L, so that the figures make two turns before they are arrested by the stop. In other words the race, started by the payment of a coin, consists of two laps, which is considered a desirable feature of the operation of the device.

In the fictitious as in the real horse-race the interest lies not entirely in seeing the figures move, but in the result, as the spectators will inevitably express a preference for one or the other of the racers. The result with small figures, such as used in toy race-courses, is frequently very close, so that the eye cannot always infallibly declare the winner. In order to announce the result with certainty, selecting and indicating mechanism have been provided and constitute special features of the invention.

The selecting mechanism comprises keys or push-knobs, which are designated $1^a$ $2^a$ $3^a$, to correspond with the racers 1 2 3, respectively. These keys constitute electric circuit changers or controllers, as presently described. The shanks of the several keys have near their inner ends notches *n* for engagement of the locking-bar N. When this bar is down, as shown in Fig. X, the keys are all locked in position, the bar being either at the end of the shank or in the notch *n*. The keys are locked and released by the action of the locking-magnet O. The locking-bar N is attached to the armature *o* of the magnet through a lever P, pivoted at *p*. When the circuit of magnet O is broken, bar N settles down by its own weight, locking the keys. When the circuit is closed, the magnet attracts armature *o*, lifts the locking-bar N, and leaves the keys free to be moved in or out from the outside of the case.

The circuit of magnet O is shown in Fig. IV. It runs from the battery X by wire 18 to magnet O, thence by wire 19 to latch K. Wire 20 runs from the other pole of battery X to coin-lever I. When the parts are in the position shown in Fig. III, the pin *l* rests against strip *q* of insulating material on the edge of latch K. Consequently the circuit is normally open at this point, and the keys are consequently locked. During the time, however, that the parts occupy the position shown in Fig. IV pin *l* is in contact with the metal part of latch K, the circuit is closed, and the keys are free. This condition prevails, as already stated, while the figures are making their first turn. Hence during this period the bystander can indicate his choice of the racing figures by pushing in the appropriate key; but as soon as the carriage throws down latch K and starts on the last lap the circuit of the locking-magnet is broken by the return of lever I to its normal position, and the keys are again locked. Thus it is not possible for the user to make another choice during the last half of the race. The keys are so constructed that the act of pushing in one throws out the other two, so that only one key at a time can be pushed in. The construction is illustrated in Fig. IX. The shanks of the keys are guided in sleeves *r* of the key-board R. On the under side of this board are pivoted three levers 20 21 22. The ends of these levers are in the path of pins 23 on the several key-shanks. It is evident from inspection of the figure that by this cross-connec-

tion of the keys only one at a time can be pushed in. If key $2^a$ be pushed in, its pins 23, acting on levers 21 and 22, would throw out $1^a$ or $3^a$, if either of these were in, and so of both the others.

When the user has made a right selection, the fact is automatically announced or indicated—that is to say, if the racing figure corresponding to the key that has been pushed in crosses the finishing-line in advance of the others, no matter how slight the distance, the indicating mechanism, which will now be described, gives notice of the fact.

S is the indicating-magnet, and when its circuit is closed its armature *s*, through a wire or cord 35, retracts the bell-hammer 36 and rings a bell 37. The circuit of this magnet will be closed, as will now be shown, only when the racing figure corresponding to the key that has been depressed is in the lead in passing the finishing-line on the second or last lap.

The circuit of magnet S and its branch circuits are shown in Figs. II and IV. From the positive pole of battery X it proceeds by wire 20 (common to this and to the circuit of magnet O) to the coin-lever, to spring-contact *t*, (when the lever I is in its normal position,) to magnet S by wire 25, and thence by wire 26 to spring-contact *u* in the path of the carriage, where the circuit is normally broken. From the negative pole of the battery wires 18 27 lead to the metallic key-board R, with which all the keys $1^a$ $2^a$ $3^a$ are in electric contact. The keys are adapted when pushed in to make contact with a spring $1^b$, $2^b$, or $3^b$, (corresponding to the racing figures 1, 2, and 3, respectively,) and these springs are connected by wires 30 with three stationary contacts $1^c$ $2^c$ $3^c$, which are in the path of three brushes $1^d$ $2^d$ $3^d$ on the carriage and at the line of finish. The brush *u*, where the other branch of the circuit terminates, is also in the path of the brush *m* of the carriage, so that the circuit of magnet S can only be closed when the carriage is at a line drawn between the brushes *u* and *c*, Fig. II, which line represents the finish.

Referring now to Figs. V and VIII, W is a light swinging frame of wire pivoted at *w* and provided with a counter-weight *x*, which keeps the upper part of the frame always in contact with the upright rods 9, 10, or 11. It is obvious that this frame will touch only that rod which is at the time in advance of the others. This frame carries three contacts $1^e$ $2^e$ $3^e$, insulated from each other and connected by wires 31 with the brushes $1^d$, $2^d$, and $3^d$, respectively. It will now be readily seen that by these circuit arrangements if the figure corresponding with the key that has been depressed be in advance when the three brushes *d* strike the three contacts *c* the circuit of the indicator-magnet S will be closed and not otherwise, for the circuit from points $1^e$ $2^e$ $3^e$ is closed through only one key, the other two branches being open. On the other hand, only one of the branches from the brushes $1^d$ $2^d$ $3^d$ is closed—namely, that corresponding to the rod 9, 10, or 11 which is at the moment nearest the front of the carriage; and in order that the circuit be completely closed it is obviously necessary that the closed branch of the carriage should correspond with the closed branch on the key-board. To make the explanation clearer, suppose the key $2^a$ be pushed in. The circuit from the battery will then be closed through this key as far as contact $2^c$. This key corresponds with the intermediate horse 2 on rod 10. If at the finish-line this rod is in advance of the others, it will be in contact with the swinging frame W at the contact-piece $2^e$, while the other rods 9 and 11 will be out of contact therewith. The circuit will then be completely closed, as follows: from spring-contact *u* to brush *m* on the carriage, thence through the frame of the carriage to rod 10, contact $2^e$, wire 31, brush $2^d$, contact $2^c$, wire 30, contact $2^b$, key $2^a$, key-board R, and so on. If at this moment one of the other horses be in advance—say No. 1—the circuit will remain open, for the rod 9 will in that case be in contact with the swinging frame W, and the circuit will be open at the contact-piece $2^e$.

It should be noticed that the indicating mechanism can never be operated at the end of the first lap, for at this time the circuit of magnet S is always open by reason of the coin-lever I being out of contact with spring *t*, as shown in Fig. IV.

Modifications may be made in the forms and arrangements of parts without departing from the spirit of the invention, and parts thereof may (if desired) be used without the whole.

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

1. In a toy race-course, the combination of a carriage adapted to make the circuit of a track, a series of racing figures mounted on and independently movable lengthwise of said carriage, and intermittently-acting devices, such as striking pins, for shifting the positions of said figures relative to said carriage, substantially as described.

2. The combination of the carriage and mechanism for propelling the same around the track, a series of racing figures mounted on said carriage and movable independently lengthwise thereof, a series of wheels, one for each figure, and eccentric-pins on said wheels for shifting the positions of said figures, substantially as described.

3. The combination, with the carriage, the racing figures mounted thereon, and driving mechanism, of a coin-actuated lever controlling a stop which arrests said carriage, and a latch for preventing the return of said lever when depressed by a coin, said latch having a projection in the path of the carriage whereby it is tripped and removed out of the way of the coin-lever, permitting the latter to return in time to arrest the carriage at the end

of the second turn or lap, substantially as described.

4. The combination of the racing figures, the driving mechanism, selecting-keys—one for each figure—an indicating device, and connections, substantially as described, whereby the indicating device is actuated, as set forth.

5. The combination of the racing figures, an indicating-magnet, the selecting-keys controlling each a branch of the circuit of said magnet, and a series of terminals in multiple arc arranged in the path of brushes carried by the racing figures, whereby the leading figure may close the circuit of said magnet, if the branch controlled by the corresponding key be closed, substantially as described.

6. The combination of the racing figures, the indicating-magnet, a circuit therefor, selecting-keys—one for each figure—controlling parallel branches of said circuit, levers cross-connecting the shanks of said keys, so that but one of said branches at a time can be closed, and other branches having open terminals in the path of brushes carried by said racing figures, substantially as described.

7. The combination of the racing figures, the coin-controlled lever for starting the same on being depressed by a coin, the selecting-keys—one for each figure—the locking-lever normally holding the keys stationary, a magnet whose circuit is closed by the depression of the coin-lever for unlocking the keys, and means, as indicated, for keeping the coin-lever depressed for a brief time after the racing figures start into motion and for releasing it before said figures reach the end of their travel, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ANDREW M. COYLE.

Witnesses:
PHILIP MAURO,
R. L. HOGUE.