

Aug. 29, 1967

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3,338,576

REMOTE CONTROLLED AMUSEMENT DEVICE WITH REVERSIBLE DRIVE

Filed Feb. 12, 1965

3 Sheets-Sheet 1

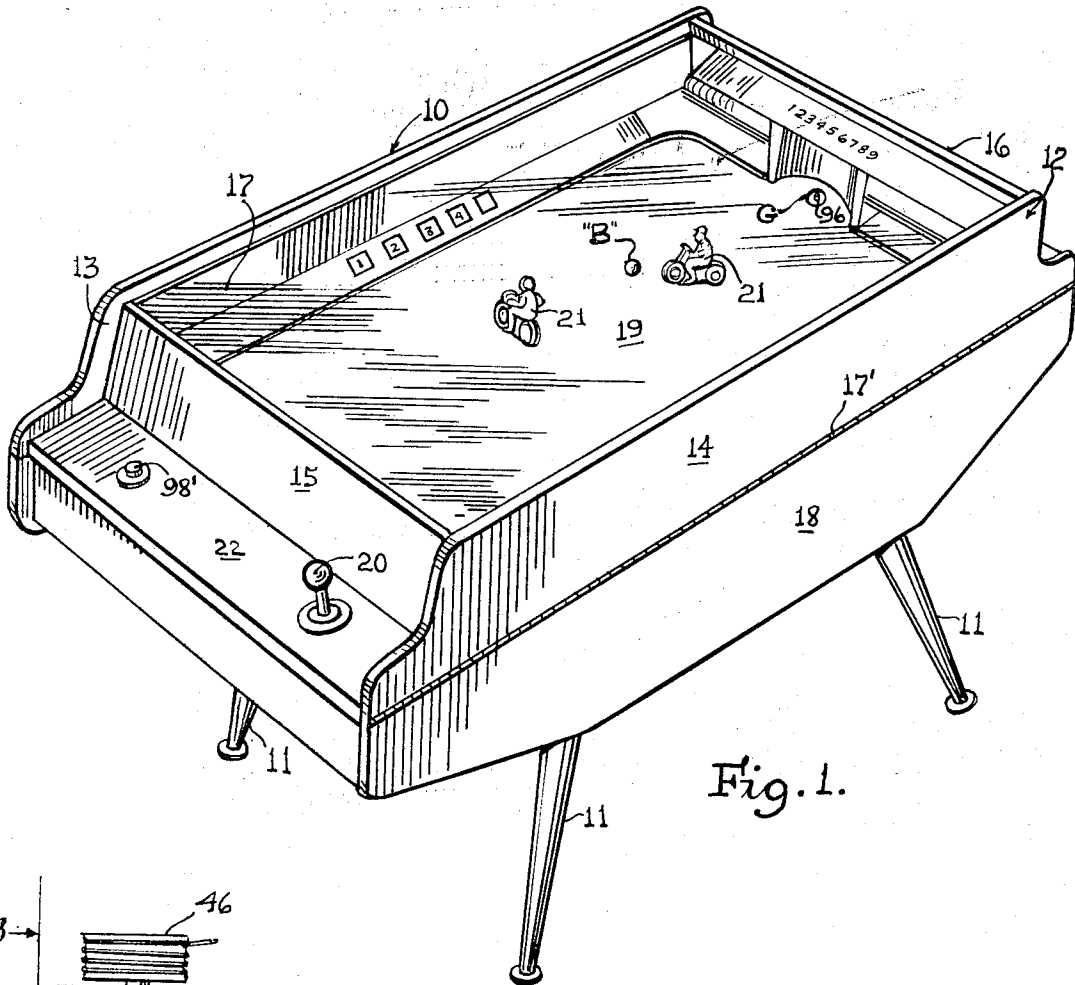


Fig. 1.

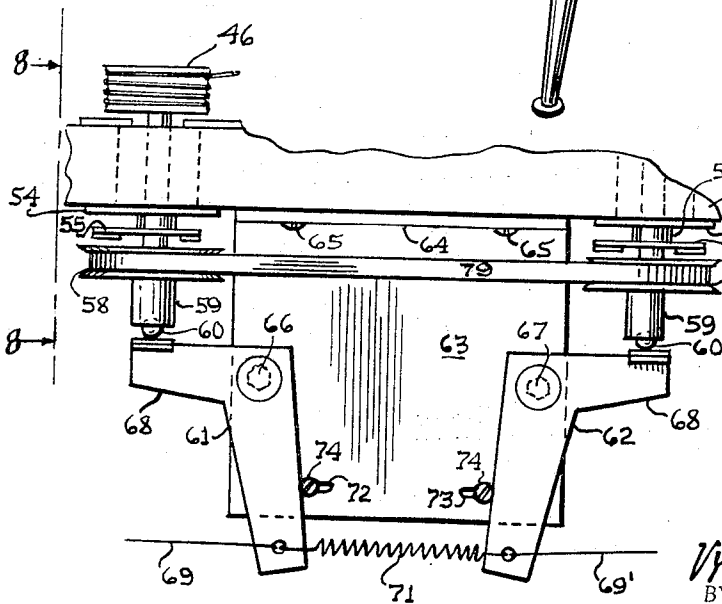


Fig. 6.

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3 Sheets-Sheet 2

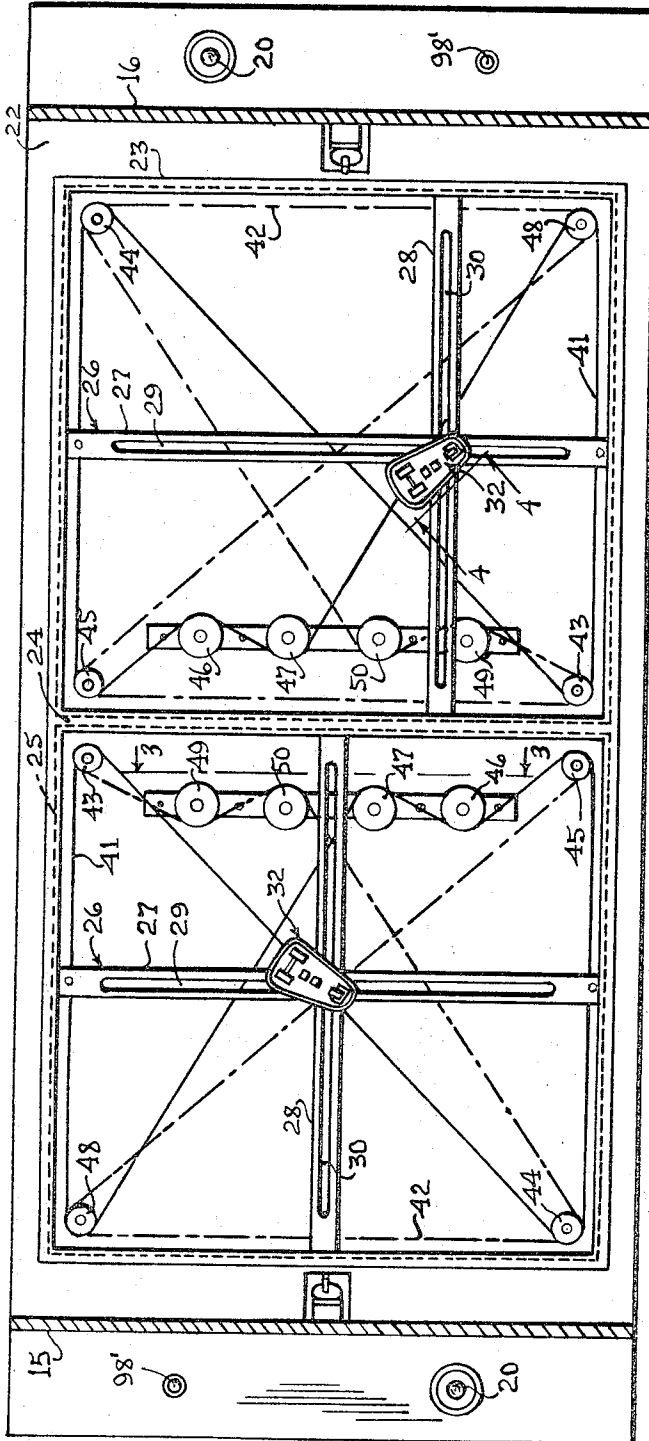


Fig. 2.

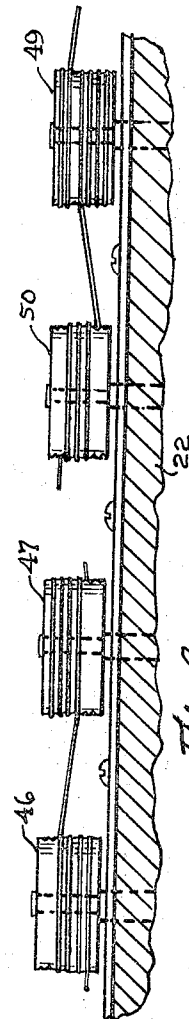


Fig. 3.

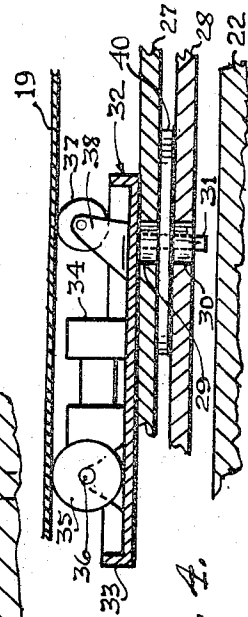


Fig. 4.

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3 Sheets-Sheet 3

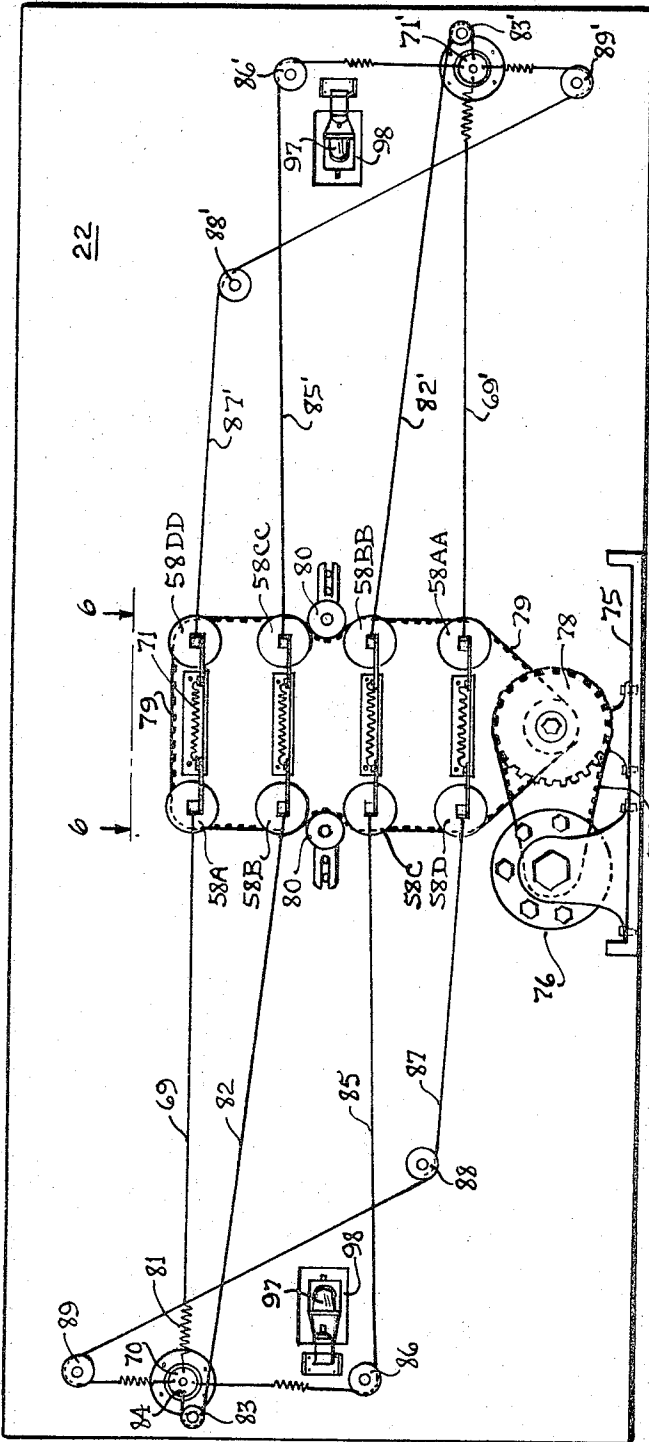


Fig. 5.

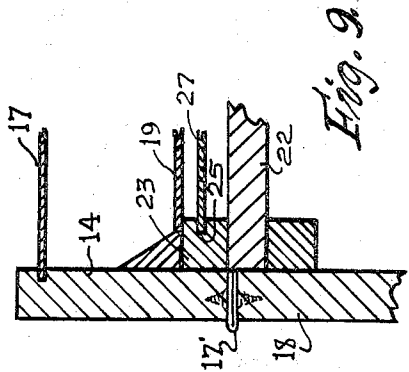


Fig. 9.

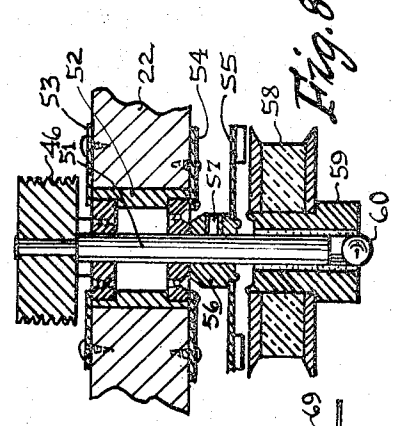


Fig. 8.

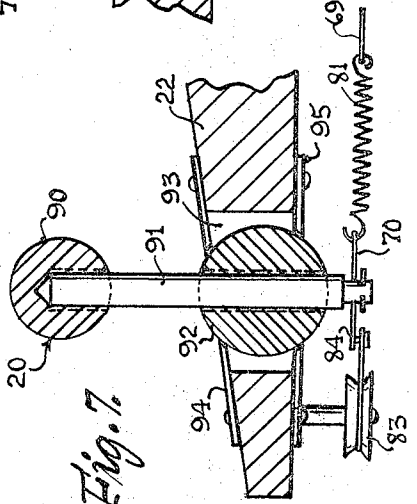


Fig. 7.

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**REMOTE CONTROLLED AMUSEMENT DEVICE
WITH REVERSIBLE DRIVE**

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4 Claims. (Cl. 273-85)

ABSTRACT OF THE DISCLOSURE

An amusement device having a remote controlled system including a magnetic playing element movable over a playing board and a magnet carrying carriage movable beneath the playing board. The carriage includes a pair of interconnected cross arms movable independently and simultaneously transversely with respect to each other. A manually controlled means for selectively operating a plurality of cable carrying pulleys for moving the cross arms of the carriage independently and simultaneously transversely with respect to each other.

The invention consists in the novel method to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings in which:

FIG. 1 is a perspective view of my improved amusement device within its playing cabinet;

FIG. 2 is a top plan view of the control mechanism within the cabinet;

FIG. 3 is a fragmentary elevational view taken on lines 3-3 of FIG. 2;

FIG. 4 is a fragmentary detailed sectional view taken on line 4-4 of FIG. 2;

FIG. 5 is a plan view of the underside of the control board as employed in my amusement device;

FIG. 6 is a fragmentary detailed perspective view taken on line 6-6 of FIG. 5;

FIG. 7 is a fragmentary detailed sectional view of the control lever as employed in my amusement device;

FIG. 8 is a fragmentary detailed sectional view taken on line 8-8 of FIG. 6; and

FIG. 9 is a fragmentary detailed sectional view of one wall structure of the cabinet housing of my improved amusement device.

Referring to FIG. 1, I show a hollow cabinet 10 which provides a housing for my improved amusement device. This cabinet 10 is adapted to be supported in an elevated playing position by a plurality of legs 11. The cabinet 10 consists of an upper portion 12 including side walls 13 and 14, end walls 15 and 16 and a transparent top wall 17. This upper portion 12 of the cabinet is hinged as at 17' to one side wall 18 of the lower portion of the cabinet 10. Within this upper section 12 of the hollow cabinet 10 beneath the transparent top wall 17, is disposed a substantially flat and unobstructed playing board 19.

My improved amusement device has for one of its objects competitive play between two opposing players who, by the manual manipulation of individual control levers 20, one being located at each end of the cabinet 10, attempt to move over the playing board 19 their respective playing elements 21. In the form illustrated in FIG. 1, the playing elements 21 are wheeled motorcycles which are adapted to engage and strike a ball B in an endeavor to cause the ball to be propelled into one of the goals G formed in either end of the playing board 19. The playing elements 21 are magnetically controlled by structure movably responsive through the individual control levers 20 which in turn affect the moving mechanism hereinafter described.

My invention is in the novel means by which each player may individually control the movement of the playing elements 21 over his portion of the playing board 19. To accomplish this object, I provide within the hollow cabinet 10 a support plate 22, the upper surface of which is disposed beneath and in spaced relation to the playing board 19. The upper surface of this plate 22 is provided with a frame 23, divided into equal parts by a partition 24 (FIG. 2). The frame 23 and the partition 24 have their inner walls grooved as at 25 so as to slidably receive the opposite ends of a cross-arm carriage 26 (see FIG. 9).

As shown in FIG. 2, each of the parts of the plate 22, as defined by the frame 23, consists of an operating mechanism which is identical in structure. Therefore, for the sake of brevity, without affecting the proper disclosure of the structure in operation, I will describe but one and will apply to both mechanisms identical reference numerals so a clear and complete understanding of the structure and its operation may be had.

The carriage 26 consists of a pair of cross-arms 27 and 28. The opposite ends of the cross-arm 27 are slidably received in the grooves 21 formed in the opposite parallel extending portions of the frame 23, while the opposite ends of the cross-arm 28 are slidably received in the grooves formed in partition 24 and corresponding end portion of the frame 23 as seen in FIG. 2 and FIG. 9. Each of the cross-arms 27 and 28 has formed therein elongated slots 29 and 30, respectively. The cross arms 27 and 28 are slidably connected together at their point of intersection by a pivot pin 31 provided by a trolley member 32 hereinafter more specifically described.

By this arrangement of the carriage 26, and the resulting movement of the cross-arms 27 and 28, as achieved in a manner hereinafter described, I have provided a mechanism which includes a cartesian coordinate type movement.

Referring to FIG. 4, I show the trolley member 32 which includes a body 33 which supports on one side thereof a permanent magnet 34. As shown in FIG. 4, the magnet 34 lies beneath and in close proximity to the underside of the playing board 19. The body 33 is provided with guide members which engage the underside of the playing board 19, and permit the trolley 32 to be freely moved thereunder. These guide members are shown as including a pair of rear wheels 35, which are rotatably journaled on a fixed rotatable shaft 36, and a front wheel 37 which is rotatably supported by a bracket 38, which includes the pivot pin 31 which freely extends through an opening formed in the body 33 and through the slots 29 and 30 formed in the cross-arms 27 and 28 and a non-friction washer 40 disposed therebetween.

From the foregoing, it is clearly apparent that the pivot pin 31 of the trolley 32 slidably connects the cross-arms 27 and 28 of the carriage 26 together for a coordinate type movement.

Referring to FIG. 2, the cross-arm 27 of the carriage 26 has its opposite ends connected to an endless drive cord 41, threaded about a series of drive pulleys as follows:

Starting at the upper end of the arm 27, drive cord 41 is threaded about a corner pulley 43, then crosses beneath the carriage 26 and is threaded about an opposite corner pulley 44, passes beneath and is connected to the lower free end of the arm 27, and continues so as to pass about a corner pulley 45; it is then threaded in an opposite direction about each of the drive pulleys 46 and 47, then about corner pulley 48 and back to the underside of the upper free end of the arm 27.

The cross-arm 28 of the carriage 26 has its opposite ends connected to an endless cord 42 threaded as follows: Again referring to FIG. 2 and starting at the left-hand

side of the frame 23, the cord 42 is connected to the underside of the free end of the arm 28, is threaded about the corner pulley 48, crosses diagonally beneath the carriage 26 and is threaded about the corner pulley 45, passes beneath and is attached to the opposite free end of the arm 28, and continues on to be threaded about the corner pulley 43, and is threaded on opposite sides of the drive pulleys 49 and 50, is then threaded about the corner pulley 44 and back to the starting point which is the free end of the cross-arm 28. By this arrangement it may be readily understood that the direction of rotation and operation of the drive pulleys 46, 47, 49 and 50 will determine the direction of movement of the arms 27 and 28 of the carriage 26 within the frame 23.

Each of the drive pulleys 46, 47, 49 and 50 is fixedly connected to a rotatable shaft 51 journaled in a suitable bearing structure 52 positioned in an opening formed in the plate 22. The bearing structures 52 are retained in place between two retaining strips 53 and 54 attached to either side of the opening and on opposite surfaces of the plate 22 as shown in FIGS. 5, 6, and 8.

As illustrated in FIG. 8, there is mounted on each of the shafts 51 a friction plate 55 which extends in a parallel spaced relation to the bottom or under surface of the plate 22. These friction plates 55 include a hub 56 which by means of a set screw 57 is fixedly connected to the shafts 51. Mounted on the free end of the shaft 51 is a drive wheel 58. This drive wheel 58 is freely journaled on the shaft 51 and adapted to be continuously rotated by a driven means hereinafter described. The drive wheel 58 includes a hub 59 containing a ball bearing 60 which is positioned in axial alignment with the shaft 51 and has its exposed portion engaged by an actuating end of a pivotal clutch arm 61 (see FIG. 6). This structure comprises the operating clutch mechanism of my invention.

Carried by the underside of the plate 22 are a plurality of mounting plates 63, there being a mounting plate for each corresponding pair of drive wheels as shown in FIG. 5. As each of the mounting plates 63, and the associated clutch actuating structure thereof is identical, I will describe but one, as it is illustrated in FIG. 6.

The mounting plate 63 provides a base flange 64 which, by means of screws 65 and the like, is mounted to the underside of the plate 22. The mounting plate 63 provides a pair of pivot pins 66 and 67 upon which are mounted a pair of pivotal clutch arms 61 and 62. These clutch arms 61 and 62 are substantially L-shaped and disposed in an inverted position so that a branch 68 thereof, supports the actuating end in engagement with the ball bearing 60. The opposite branch portions of each of the L-shaped clutch arms 61 and 62 are connected to control elements 69 and 69', which are in turn respectively attached to control plates 70 and 71' which form part of the manually operated control levers 20, hereinafter more fully described. Extending between the branch portions of each of the clutch arms 61 and 62, which are pivotally carried by the support plate 63, is a coil spring 71. The tension of the coil spring 71 is sufficient to yieldably pivot the clutch arms 61 and 62 about the pivot pins 66 and 67 so that the actuating end thereof is maintained in engagement with the ball bearing 60 of the friction clutch mechanism hereinbefore described.

The supporting plate 63 is provided with adjusting slots 72 and 73 through which extend stop pins 74 which in turn engage an edge portion of each of the clutch arms 61 and 62 so as to determine the amount of pivotal movement of each arm about its respective pivot pin under the tension of the connecting spring 71.

Referring to FIG. 5, which is a plan view of the underside of the support plate 22, I show a mounting bracket 75 supporting an electric motor 76, which by means of a drive belt 77 engages and rotates in one direction a drive wheel 78. This drive wheel 78 in turn rotates a drive belt 79 having operable engagement with each of the drive wheels 58 associated with each of the drive pulleys 46, 47,

49, and 50. Upon energization of the electric motor 76, each of the drive wheels 58 will be caused to rotate by reason of its connection with the drive belt 79. To maintain the drive belt 79 in positive driving connection with each of the drive wheels 58, I have provided a pair of idler wheels 80, as shown in FIG. 5. These idler wheels 80 are adjustable so that proper tension of the drive belt 79 is maintained for the purpose hereinafter made apparent.

Referring to FIG. 5, I show the means by which each of the above described friction clutch mechanisms is connected to its corresponding control plate 70 and 71', which latter elements are a part of the manually operable control levers 20. As such it is readily seen that the clutch mechanism 58A by control element 69 (one end of which is connected to the clutch arm 61 as hereinbefore described) is connected to a coil spring 81 which is in turn connected to one side of the control plate 70. The clutch mechanism 58B by a control element 82 which is threaded about a pulley 83, is connected as at 84 to the opposite side of the control plate 70. The clutch mechanism 58C by a control element 85 threaded about a pulley 86 is connected to the control plate 70 at a point spaced 90° from the connection of control elements 69 and 82 to the control plates 70. The last clutch mechanism 58D is connected to the opposite side of the plate 70 by a control element 87 threaded about a pair of pulleys 88 and 89. Thus the control elements 69, 82, 85 and 87 may be moved to effect actuation of their respective clutch mechanisms in a manner and for a purpose hereinafter described.

The same construction exists with respect to the four clutch mechanisms associated with the control plate 71'. As shown in FIG. 5, the clutch mechanisms 58AA, 58BB, 58CC, and 58DD, are connected to their control plate 71' at points spaced 90° with respect to each other by control elements 69', 82', 85' and 87' with the control element 82' being threaded about a pulley 83', and with the control elements 85' being threaded about a pulley 86', and lastly the control elements 87' being threaded about a pair of pulleys 88' and 89'.

In FIG. 7, the construction and arrangement of parts of the manual control lever 20 is illustrated. Thus, it is seen that lever 20 includes a handle portion 90 which is carried at one end of elongated shaft 91, which in turn is journaled through a ball bearing 92 freely carried in an opening 93 formed in the plate 22. The ball bearing 92 is held loosely in place in the opening 93 by a pair of retaining plates 94 and 95 fixedly attached to either side surface of the plate 22. The free end of the shaft 91 has attached thereto the control plate 70. The manual control lever 20 which is associated with the control plate 71' is of the same construction and operates in the same manner. By this description of the construction of the control lever 20, it is readily apparent that there is a universal movement afforded the control lever 20.

The operation of the structural and mechanical elements of the game device is as follows:

By any suitable means such as coin switch (not shown) and which makes up no part of this invention, the electric motor 76 may be energized. The energization of the electric motor 76 will, through drive belts 77 and 79, effect continuous rotation of all of the drive wheels 58 of each of the clutch mechanisms, 58A, etc. as shown in FIG. 5.

When one of the players moves his respective control lever 20 out of its normal vertical position as shown in FIG. 7, for example, to the right, the control element 69 will be pulled, which in turn will cause the clutch arm 61 to pivot about its pivotal connection 66 causing the free end of its branch portion 68 to engage the ball bearing 60 (FIGS. 6 and 8) so as to move the drive wheel 58 axially on the shaft 51 into frictional engagement with the friction plate 55, causing the shaft 51 and its respective drive pulley to rotate. In this instance, referring to FIG. 2, the operation will cause the drive pulley 46 to rotate in a clockwise direction. By reason of the direction of the winding of the drive cord 41 about such drive pulley 46, the

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resulting movement thereof will cause the cross-arm 27 of the carriage 26 to move to the right, as shown in FIG. 2. This movement of the arm 27 will effect movement in a like direction of the trolley member 32 and through the magnetic attraction of the magnet 34 carried thereby will cause a like movement of the magnetically attracted playing element 21 to be moved over the playing board 19 toward the right, as shown in FIG. 1. If the control lever 20 was moved to the left as seen in FIG. 7, such movement would effect a like movement of control element 82, which in turn would actuate the clutch mechanism 58B causing rotation of the drive pulley 47 and by the direction of the winding of the drive cord 41 thereon, would cause a movement of the cross-arm 27 in an opposite direction, that is, to the left as seen in FIG. 2, with the same effect upon the playing element 21.

By the manipulation of the control lever 20 either forward or backward, or to either side, as seen in FIG. 1, the player may selectively engage the clutch mechanisms 58A through 58C, causing rotation of the drive pulleys 46-47, and 49-50, so as to move the cross-arms 27 and 28 of the carriage 26 beneath the playing board 19.

If the player should move the control lever 20 diagonally or angularly with respect to the points of connection between the control elements 69, 82, 85, and 87, it is possible to operatively engage a pair of clutch mechanisms such, for example, clutch mechanisms 58A and 58D. This operation would cause movement of the cross-arm 27 to the right, as seen in FIG. 2, and simultaneously cause movement of the cross-arm 28 in an upward direction as shown in such figure. Thus a universal movement may be achieved for the trolley 32 and the magnetically attracted playing element 21.

The same operation and result is achieved by the opposing player through the manipulation of his control lever 20 and the resulting movement of the control plate 71' carried thereby. If a player is successful in moving his playing element 21 over his half of the playing board 19 in a manner that causes the game ball B to be rolled into the opening (goal G), a point is scored for such player and may be visually indicated on the playing board in any approved manner. The goal G has as a portion thereof the free end 96 of an armature 97, of a solenoid 98, carried by the underside of the plate 22. The solenoid 98 is energized by the player by pressing the replay button 98' carried by the exposed end of the plate 22 as seen in FIG. 1. This button 98' energizes the solenoid 98 effecting the movement of the armature 97 associated therewith so that its free end 96 will kick the ball B out of the goal G and onto the playing board 19.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

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

1. A game apparatus having a pair of magnetically attracted playing elements movable over a playing board, including a hollow cabinet providing a flat playing board and a supporting plate within said cabinet, a movable magnet carrying carriage for each playing element comprising in part a pair of interconnected cross arms carried by the supporting plate beneath the playing board with the cross arms slidably connected one to the other so that each arm may be moved independently and simultaneously transversely with respect to each other, wherein the improvement comprises,

(a) a plurality of pulley wheels above said supporting plate and connected to the cross arms of the carriage for moving each of the arms independently and simultaneously transversely with respect to each other,

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(b) a continuous cable for each of the cross arms of the carriage connecting the opposite ends of each of said cross arms to certain of said pulley wheels,

(c) each of said cables wound about a set of at least two of said plurality of pulley wheels with the cables being wound in opposite directions upon each of the pulley wheels in said set to effect opposite directional movement of the cables thereover,

(d) means consisting of a plurality of drive wheels carried beneath said supporting plate for rotating each of said set of pulley wheels in the same direction with each of the drive wheels providing a hollow elongated hub extending from one side thereof,

(e) a shaft provided by each of said set of pulley wheels freely projected through the supporting plate and into a hub of one of said drive wheels so as to position each of said set of pulley wheels in a horizontal plane parallel to and vertically aligned with one of said drive wheels with said last mentioned drive wheels movable axially on said shafts,

(f) a clutch plate keyed to each of said shafts of each of said set of pulley wheels and in confronting spaced relation to the opposite side of each of said drive wheels mounted upon said shafts,

(g) manually controlled means for selectively moving axially each of said drive wheels on its shaft into frictional contact with a clutch plate carried by said shaft so as to rotate said pulley wheel connected to said shaft to wind thereabout the cable wound thereon, said set of pulley wheels being freely rotatable when not engaged by said drive wheels through said clutch plate, and

(h) means carried by said supporting plate for continuously and simultaneously rotating said drive wheels in one direction independently of said pulley wheels.

2. A game apparatus as defined by claim 1 wherein the manually controlled means comprises a pivotal arm for each of said drive wheels having an end portion supporting one end of said drive wheels, and means for individually pivoting each of said arms so that its end portion will move the respective hub and drive wheel axially on said shaft of the respective pulley wheel into frictional contact with one of said clutch plates carried on said shaft to rotate the respective pulley wheel with said continuing rotating drive wheel to wind thereabout the cable wound thereon to move one of the cross arms relative to the other.

3. A game apparatus as defined by claim 2 wherein said means for continuously and simultaneously rotating said drive wheels comprises an electric motor rotating a drive belt which engages each of said drive wheels so as to continuously rotate said drive wheels in one direction.

4. A game apparatus as defined by claim 1 wherein said means for continuously and simultaneously rotating said drive wheels comprises an electric motor rotating a drive belt which engages each of said drive wheels so as to continuously rotate said drive wheels in one direction.

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