

[54] HOCKEY GAME

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[52] U.S. Cl.273/85 B, 273/127 R, 273/129

[51] Int. Cl.A63f 7/06, A63f 7/12

[58] Field of Search.....273/85 A, 85 B, 94 C, 94 D,
273/94 E, 94 F, 129

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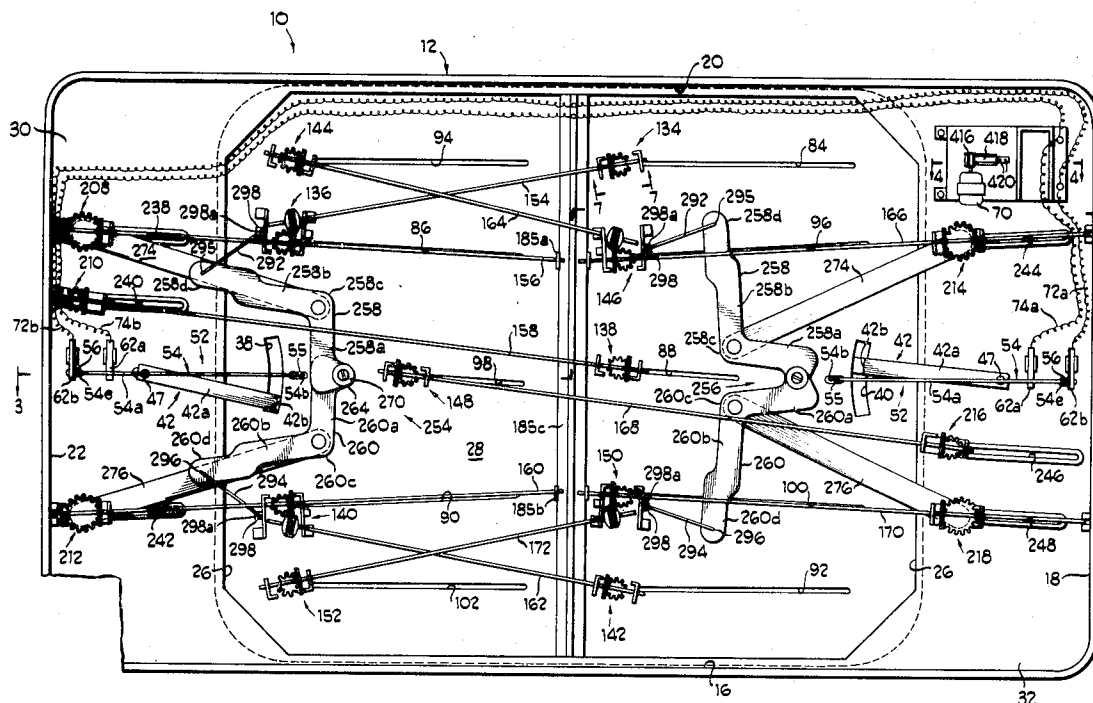
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[57] ABSTRACT

An improved game of the table hockey type characterized by the provision of linkage arrangements for operating simulated hockey players which require reduced to and fro movement to accomplish full to and fro movement of the players and wherein some controls operate more than one player. In addition, the hockey game is provided with a timekeeping device and associated audible signal means as well as audible signal means to indicate the score of a goal.

17 Claims, 18 Drawing Figures



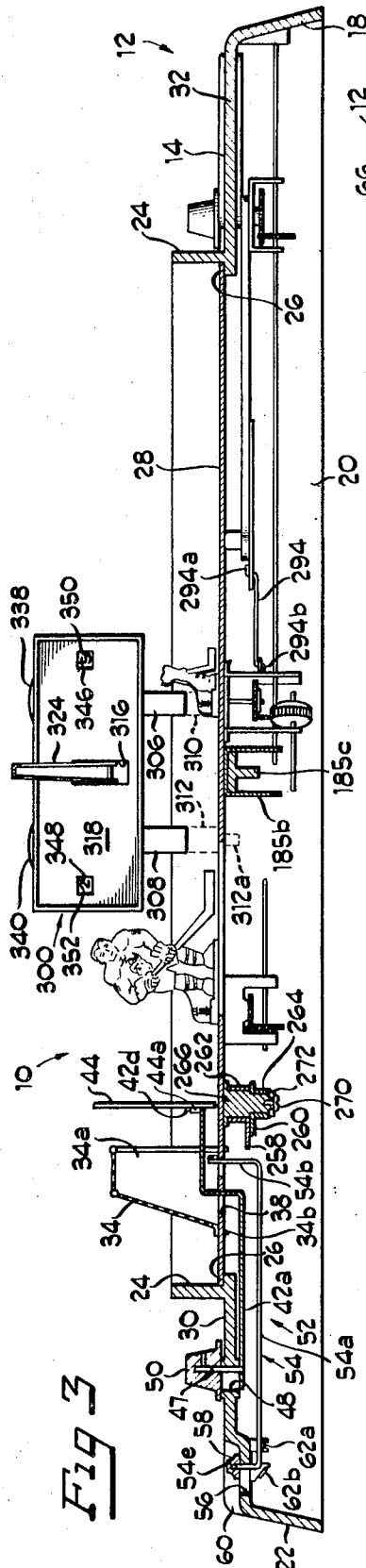


Fig. 3

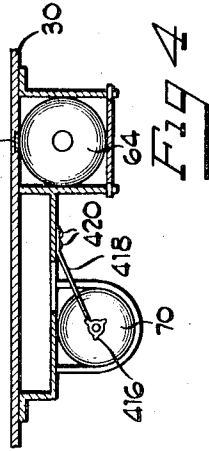


Fig. 4

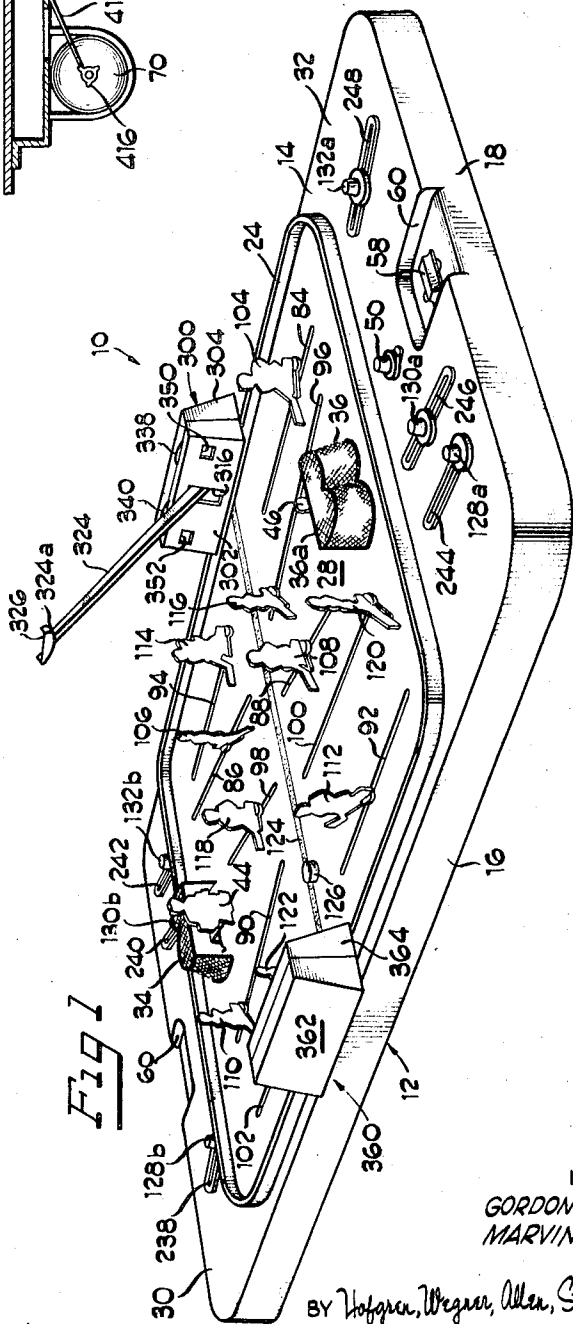


Fig. 1

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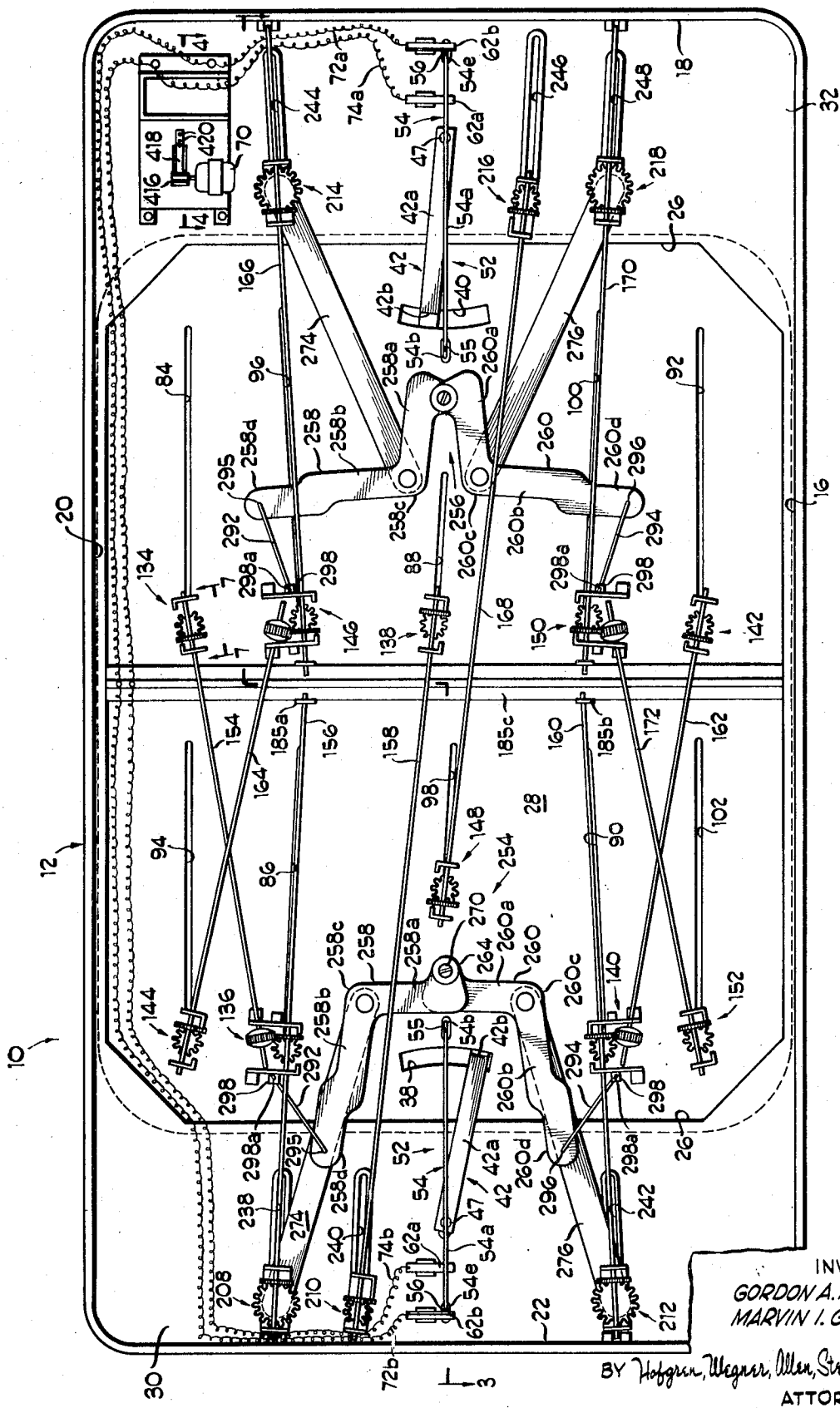


Fig 2

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Fig 7

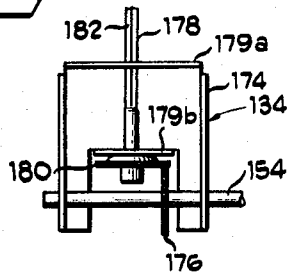


Fig 8

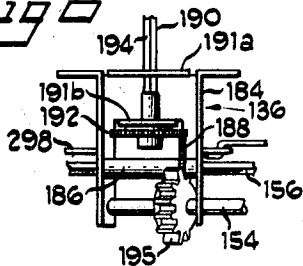


Fig 9

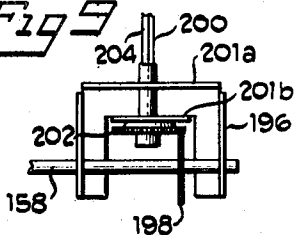


Fig 10

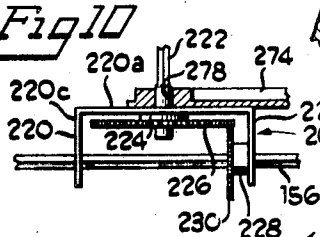


Fig 11

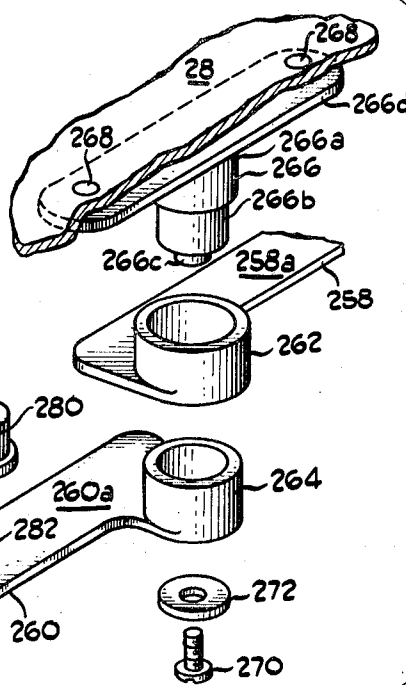
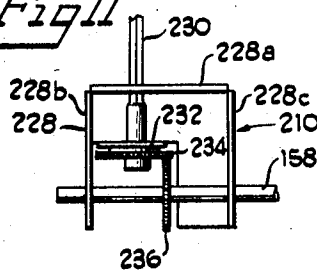


Fig 5

Fig 6

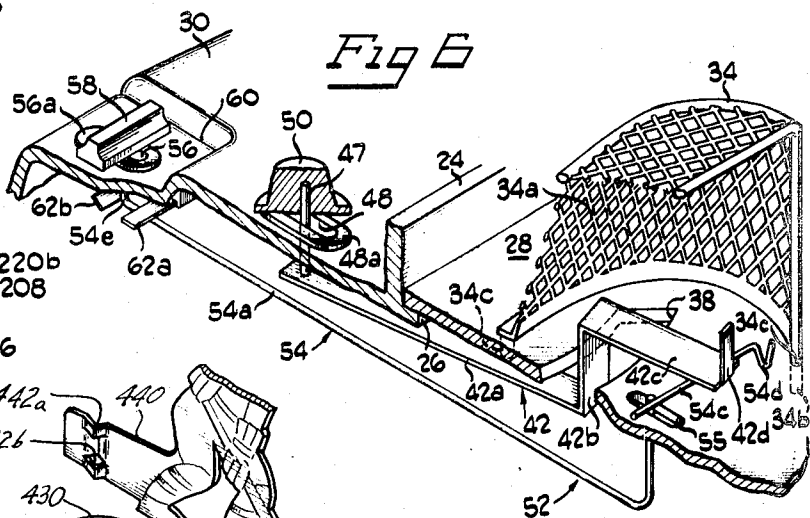
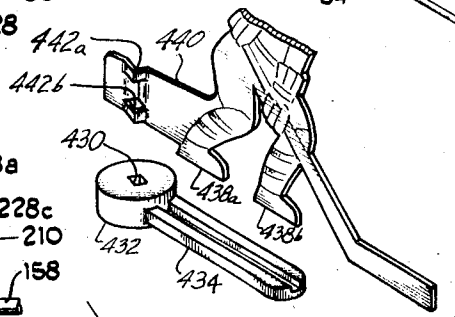


Fig 12



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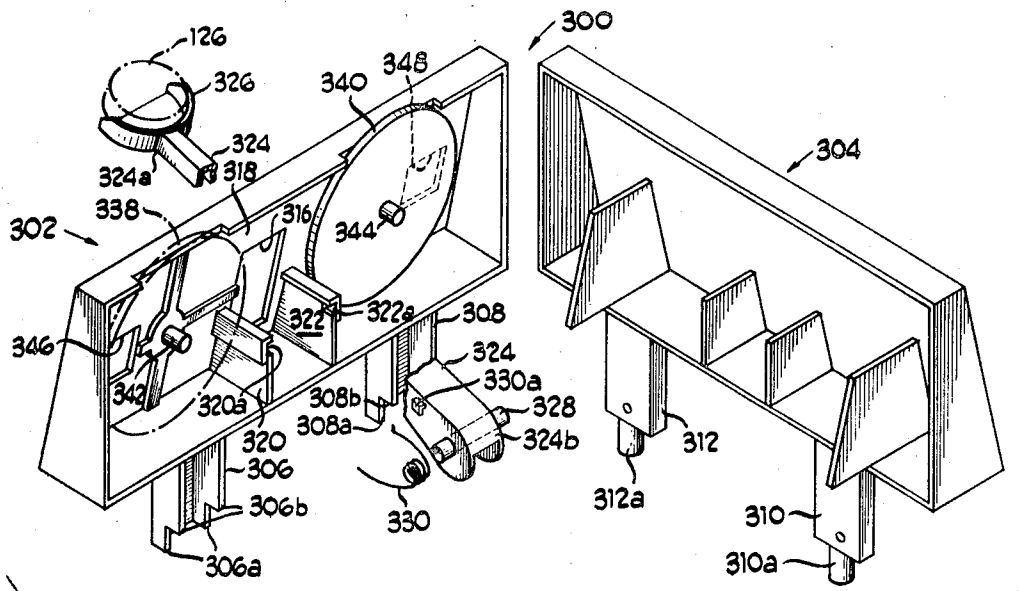


Fig 13

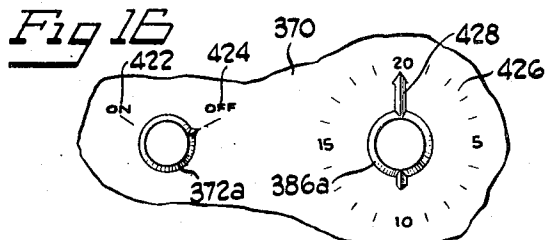


Fig 16

Fig 15

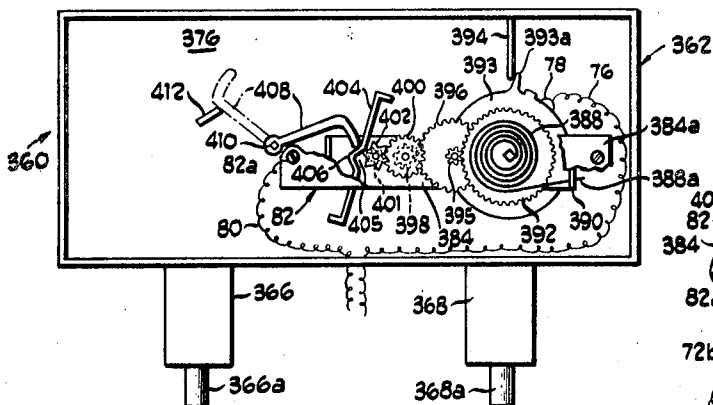


Fig 14

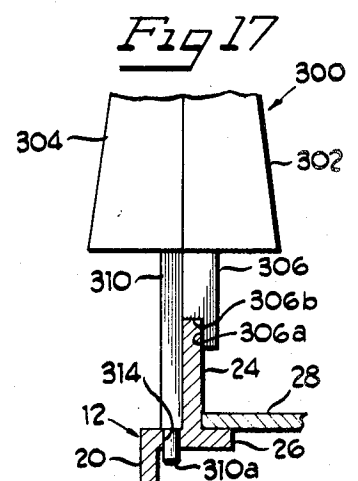
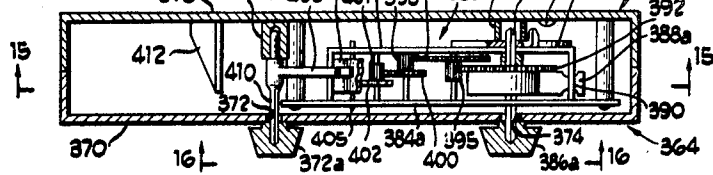


Fig 17

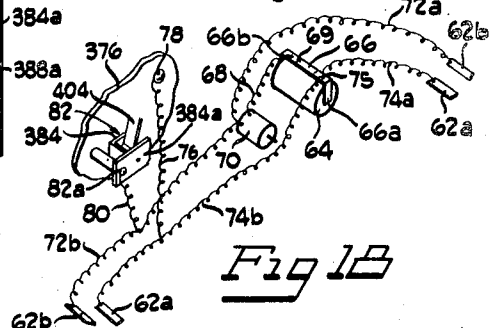


Fig 18

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HOCKEY GAME

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to game devices, and more particularly, to a table game apparatus of the type wherein a playing element is attempted to be introduced into a goal by simulated players, such as a simulated hockey game apparatus.

2. Brief Description of the Prior Art

Art known to the applicant relating to the instant invention includes the following U.S. Pat. Nos.:

Munro et al.	2,048,944
Untener	2,079,136
Widgren et al.	2,229,232
Henderson	2,237,486
Munro	2,382,328
Kohler	2,507,258
Widgren et al.	2,698,179
Peters	2,819,082
Lebrun	2,964,320
Munro et al.	3,105,687
Wertz	3,112,930
Dennison	3,228,688
Ek	3,240,495
Cane	3,428,316

Generally speaking, all of these patents relate to table game apparatuses which simulate the well-known game of hockey. There are many forms of such game apparatuses currently offered in the marketplace, and these games have proved to be extremely popular with persons of diverse age groups.

Generally speaking, these games offer the advantage of a very close simulation of the hockey game, in that simulated players may be moved to and fro along the playing surface and also may be rotated about a vertical axis to effectuate a stick swinging motion for passing or shooting a simulated puck towards the goal. The most common form of the simulated hockey games involves a plurality of slots in the game board equal to the number of players, except for the goalie, for each team. Generally speaking, there are ten slots, five for each team. Typically, three elongated slots extend throughout the offensive zone for each team for receiving and tracking three offensive players and two slots are provided in the defensive zones of each team for receiving and tracking two defensive players. Usually, these players are connected through suitable gearing or spring arrangement to elongated, generally horizontally disposed, linkage members which are movable in a horizontal plane and are rotatable about a horizontal axis. To and fro movement of the linkage members move the players to and fro, and rotation of the members about a horizontal axis causes a pivotal movement of the simulated players. Simulated goal areas are provided at each end of the playing surface and some such goals may be provided with recessed portions in the playing surface so as to make it clearly evident that a goal has been scored when a puck is shot into the goal.

Since these forms of hockey games are quite popular and enjoyed by participants of many ages, it is most desirable to continue to strive to improve such structures to enhance the enjoyment and participation therein. Some shortcomings in the present forms of these games include the need to move the player control linkage to and fro a distance corresponding to the to and fro movement to be imparted to the player, thus requiring extensive arm sweep by the participant in a to and fro direction. This makes it difficult for a participant to position himself close to the point of action of the game in that the to and fro linkage necessary to move the players interferes with a participant's position adjacent the game board. Moreover, the participant must, with only two hands, control six player control knobs, one for the goalie and five for the remaining offensive and defensive players. The participant, while attempting to keep his eyes on the puck, must also attempt to select the right player control knob for appropriately initiating defensive or offensive action. Furthermore, sometimes visual observation of whether or not a goal has been

scored, has led to many disputes in that it is possible for a puck to enter the simulated net and rebound outwardly therefrom without ever coming to rest in the recessed area of the goal.

Thus, this invention is directed to a need and desire in the art for improving games of the table hockey type, both with respect to the specifically mentioned shortcomings, and other features as well.

SUMMARY OF THE INVENTION

This invention is directed, in brief, to the provision of an improved game apparatus of the table hockey type.

The best mode currently contemplated for carrying out the invention includes the provision of a game board with linkage and player members connected thereto. It is intended that common linkage is to be utilized to control more than one player. Thus, a defensive and offensive player may be connected to the same master control linkage so that movement of the master control linkage will move both players simultaneously. In addition, the control linkage includes an over-center throw arrangement wherein only limited to and fro movement of the linkage is necessary to impart extended to and fro movement of a simulated player. Control of the movement of the players is to be accomplished by movement of a control knob across the top of a portion of the game board behind each goal but within the bounds of the game structure itself, and rotational movement is to be imparted to the players by rotating a knob about a vertical axis.

In addition, the goal area includes an arm connected to circuitry so that when the puck enters the goal area and strikes the arm, the circuit will close producing an audible sound for indicating that the goal has been scored. The game further includes a timer mechanism associated with circuitry for activating an audible signal at the end of predetermined time periods constituting a "period" of the game and a means for the random deposit of a puck for center faceoffs or the like.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the simulated hockey game apparatus of this invention;

FIG. 2 is a bottom plan view of the game shown in FIG. 1 showing the player control linkage, game board player traversing slots and substantial portions of the audible goal signal circuitry;

FIG. 3 is a transverse sectional view taken generally along the lines 3—3 of FIG. 2;

FIG. 4 is a fragmentary sectional view through the audible signal box taken generally along the lines 4—4 of FIG. 2;

FIG. 5 is an exploded, partial perspective view, of a portion of the linkage arrangement for player control;

FIG. 6 is a fragmentary perspective view of the goalie control and goal audible signal structure mechanism;

FIG. 7 is a fragmentary sectional view along the lines 7—7 of FIG. 2 showing a portion of the player control linkage and gearing arrangement for an offensive player corresponding to a "wingman;"

FIG. 8 is a fragmentary sectional view of a portion of the linkage and gearing arrangement for a defensive player corresponding to a "defenseman;"

FIG. 9 is a fragmentary section view through a portion of the linkage and gearing arrangement for an offensive player corresponding to a "center;"

FIG. 10 is a fragmentary section view through a portion of the linkage and gearing arrangement adjacent the participant's control knob for the master control of the linkage governing the movements of a "defenseman" and a "wingman;"

FIG. 11 is a fragmentary sectional view through a portion of the linkage and gearing arrangement adjacent the participant's control knob for the controls governing the movement of a "center;"

FIG. 12 is a fragmentary, exploded, perspective view of an arrangement for the mounting of a simulated player to the linkage of the game apparatus;

FIG. 13 is an exploded perspective view of portions of the score board component and puck release mechanism of the game of this invention;

FIG. 14 is a horizontal section view through the timer portion of the game of this invention;

FIG. 15 is a vertical section view taken generally along the lines 15—15 of FIG. 14;

FIG. 16 is a fragmentary section view taken generally along the lines 16—16 of FIG. 14;

FIG. 17 is a fragmentary section view of the mounting arrangement for the score board and timer housings to the game board; and

FIG. 18 is a fragmentary perspective schematic view of the wiring arrangement for the game apparatus of this invention;

While this invention is susceptible of embodiment in many different forms, there is shown in the drawings and will herein be described in detail a specific embodiment thereof, with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the invention to the embodiment illustrated.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

The game 10 of this invention includes a base 12 preferably made from a molded plastic material, but which may be made from other suitable materials such as pressed wood, metal or the like. Base 12 includes a top portion 14 having depending sidewalls 16, 18, 20 and 22 supporting the top in elevation relative to a supporting surface. The top 14 includes an upstanding, generally rectangular rib 24, and a small lip 26 which projects centrally inwardly from the bottom of the rib. The rib 24 defines a simulated fence bordering a playing surface 28 which is supported on the lip 26 and may be secured thereto by adhesives, fasteners or other suitable securement means. The playing surface 28 may be made of a material similar to that of the base 12, such as a plastic, pressed wood, metal or the like. The remaining portion of the base 12 outside of the fence includes control areas 30 and 32 at the opposite ends thereof.

With particular reference to FIGS. 1, 2, 3 and 6, the playing surface 28 includes a pair of mutually opposed, inward facing, goals 34 and 36, each having an open end or mouth 34a and 36a, respectively. Goals 34 and 36 are preferably connected to the playing surface by means of depending tabs, such as 34b, received in openings, such as 34c, in the playing surface. The playing surface 28 is provided with arcuate slots 38 and 40 within the area of the goals 34 and 36, respectively. Slots 38 and 40 extend across most of the width of the goal areas.

Goalie linkage members 42 extend through each of the slots 38 and 40. Preferably, the linkage members 42 are made of a thin, sheet metal structure and include an elongate horizontal portion 42a which is positioned in the underside of the base, and intermediate upright portion 42b which extends uprightly through slots 38 and 40. Slots 38 and 40 are transversely widened relative to portion 42b to allow to and fro movement of linkage members 42. Each linkage member 42 further includes a short, vertically offset horizontal portion 42c which is positioned above the playing surface 28 within the area of the goals 34 and 36. Portion 42c terminates in an upright tongue 42d for supporting a simulated goalie member, such as goalie 44 for goal 34 and goalie 46 for goal 36. The rear of each of the goalies has a pair of vertically aligned slots 44a (as shown on goalie 44) formed therein, such as by being struck outwardly from the face of the goalie, for receiving the upright tongue 42d on goalie linkage 42 to secure each simulated goalie player 44 and 46 to tongue 42d.

The opposite or control end of linkage 42 remote from the end to which the goalie 44 or 46 is secured is provided with an upright pin 47 at the end of portion 42a. Pin 47 extends through each of slots 48 formed medially in the opposite control areas 30 and 32 of base 12. Slot 48 is short and slightly elongated in the to and fro direction with respect to the play-

ing surface 28 and the mutually facing goals for permitting limited to and fro movement of the simulated goalie 44 or 46 with respect to the mouth 34a or 36a of goal 34 or 36, respectively. The area around slot 48 may be slightly raised to form a bearing surface 48a for engagement with the underside of the goalie control knob 50 affixed to pin 47, such as by frictional interfitting or other suitable means, such as a setscrew, or the like. Through the arrangement of slots 48 and 38 and the linkage 42, to and fro movement of goalie 44 or 46 may be accomplished by pushing knob 50 to and fro with respect to slot 48, and side to side movement of goalie 44 or 46 with respect to the mouth 34a or 36a of goal 34 or 36 may be accomplished by rotation of knob 50 to permit the linkage 42 to laterally traverse in the slot 38. Through these movements, opposing participants may attempt to block shots at their respective goals.

With continued reference to FIGS. 1, 2, 3 and 6, the game further includes a goal signal means 52 for each goal 34 and 36. Goal signal means 52 includes a signal linkage element 54 preferably made of a thin rod of metal or the like. Signal linkage element 54 includes an elongate portion 54a positioned below the elongate portion 42a of goalie linkage 42 and thereby in the underside of control portions 30 and 32 of base 12. The linkage further includes an upturned, forward end 54b which extends through short elongate slots 55 in the playing surface 28 just forward of slots 38. A short crossrod 54c is secured transversely across the upper end of forward portion 54b to generally span the distance across the mouth of each of the goals 34 and 36. Opposite ends of crossbar 54c are provided with depending legs 54d to support the crossbar portion 54c in slight elevation with respect to the playing surface 28. Signal linkage 54 further includes an upturned rear end 54e which extends through slightly elongated slots 56 at opposite ends of the base in each of the control areas 30 and 32. Slot 56 is also preferably bordered by a small upraised bearing surface 56a for engagement with the underside of goal signal means control knob 58. As shown in the illustrated embodiment, preferably the slot 56 is formed in a small recessed portion 60 in the opposite end of the base 12.

A pair of contact members 62a and 62b are connected to the underside of the control areas 30 and 32 of base 12 in the area adjacent slot 56. The forward or innermost positioned contact 62a is in sliding facial engagement with the signal linkage 54. The other contact 62b is preferably canted and normally kept spaced from the upturned portion 54e of linkage 54 a distance slightly less than the length of slots 55 and 56. When linkage 54 is moved rearwardly, such as in response to a puck hitting the crossbar 54c, this rearward movement will cause the upturned portion 54e to engage contact 62b and complete a circuit between the two contacts.

The contacts are parts of circuitry best seen in FIG. 18. The contacts 62a and 62b at opposite ends of the game board are shown connected with the wiring and signal and power components of the circuitry. A source of power, such as a battery 64, is positioned in a bracket 66 with opposite ends 66a and 66b of the bracket embracing the positive and negative goals of the battery in the well-known manner. Wire 68 leads from the positive end 69 of bracket 66 to a motor 70. Wires 72a and 72b lead from the motor to the opposite contacts 62b. Wires 74a and 74b lead directly from the negative end 75 of the battery bracket 66 to each of the opposite contacts 62a. A wire 76 leads from wire 72b to a ground 78. Another wire 80 leads from wire 72b to a post portion 82a of a mechanism 82 for producing an audible signal which will be explained in detail later. Thus, when the circuit is completed across either of the contacts 62a or 62b by rearward movement of linkage 54 in response to a puck, the mechanism 82 will be activated to produce an audible signal and indicate that a goal has been scored. The circuit may be reset by merely moving the linkage 54 forwardly by means of forward movement being imparted to knob 58 to move portion 54 away from contact 62b. Thus, the upturned forward end 54b will move forwardly in slot 55 and push the crossbar 54c forwardly to a position approxi-

mately in alignment with the mouth 34a or 36a of goal 34 or 36, respectively.

As best seen in FIGS. 1 and 2, there are five player traversing slots 84, 86, 88, 90, 92 and 94, 96, 98, 100, 102 in each half of the playing surface 28. The outermost slots or those slots adjacent fence 24, such as 84, 92, 94 and 102 are for supporting mechanism for offensive players corresponding to the so-called "wing" or "wingman" in the game of hockey. Each team includes two such players. The middle slots 88 and 98 are also for supporting mechanism for offensive players corresponding to the "center" in the game of hockey. Each team has one such player. Those slots 86, 90, 96 and 100 are for supporting mechanism for the defensive players corresponding to the "defenseman" in the game of hockey. Each team has two such players. One team's two defensive players are in the same half of the playing surface as the other team's offensive players. Thus, each team has three offensive players in the opponent's half of the game board and two defensive players in its own half of the game board.

The game further includes simulated players connected to the aforementioned supporting mechanism (to be explained), such as wingman 104, defenseman 106, center 108, defenseman 110 and wingman 112 in one half of the playing surface and wingman 114, defenseman 116 and center 118, defenseman 120 and wingman 122, in the other half of the game board. Thus, including the goalies 44 and 46, each team has six simulated players corresponding to that in the game of hockey.

A centerline 124 may be provided on the playing surface 28 for dividing the playing surface into the respective offensive zones. A playing piece or simulated puck 126 is also shown in FIG. 1 adjacent the center line 124.

In addition to the goalie control knob 50 and the goal signal reset knob 58, each control area 30 and 32 of base 12 further includes player control knobs 128a and 128b, and 130a and 130b, and 132a and 132b, respectively. These knobs are for controlling the to and fro and pivotal movement of the several players 104 through 122 through suitable linkage and supporting mechanism as will be explained.

For controlling the movements of each of the players 104 through 122, there is an associated player pivot assembly 134, 136, 138, 140, 142, 144, 146, 148, 150 and 152, and related, generally horizontally disposed (relative to playing surface 28), player link element 154, 156, 158, 160, 162, 164, 166, 168, 170 and 172, respectively.

The player pivot assemblies 134, 142 and 144, 152 for each of the opposing pairs of so-called "wingmen" are substantially identical and typified by the assembly 134 shown in FIG. 7. Thus, only this assembly will be described with the understanding that the description applies to assemblies 142, 144 and 152 as well. The assembly 134 includes a generally U-shaped frame or bracket structure which is impaled on the respective link element 154 and fixed thereto for to and fro movement with the link, while permitting rotational movement of the link element 154. Link element 154 has a gear 176 affixed thereto with bracket 134 for rotation with the link. The bracket 174 rotatably uprightly supports a player mounting stud 178 generally transversely to link 154 in ears 179a and 179b. At its lower end, stud 178 includes a gear 180 positioned generally transverse to gear 176 and in meshing engagement therewith so that rotation of the link 154 and gear 176 imparts rotational movement to stud 178 by way of gear 180. Preferably, the upper end of stud 178 is provided with a multifaceted periphery 182, such as the square periphery shown herein.

The inner end of each link 154, 162, 164 and 172 is rotatably mounted to a related "defenseman" pivot assembly 136, 140, 146 and 150, respectively, but fixed thereto for to and fro movement therewith. The several player pivot assemblies 136, 140, 146 and 150 for the opposed pairs of "defensemen" are also substantially identical and are typified by the assembly 136 shown in FIG. 8. Thus, only this assembly will be discussed with the understanding that the description applies

to assemblies 140, 146 and 150 as well. Assembly 136 includes a generally U-shaped frame or bracket structure 184 through which link 156 extends. The outer end of each link 156, 160, 166 and 170 is rotatably connected to a spaced pair of inverted U-shaped brackets 185a and 185b secured to the underside of playing surface 28 by a transversely, medially spanning T-bar 185c. A sleeve 186 is positioned about link 156 in the area of the bracket 184 and supports a gear 188. Link 156 is connected to bracket 184 for to and fro movement with the bracket 184. In addition, the link 156 is rotatable relative to bracket 184 and the sleeves 186 and gear 188 are fixed for rotation with link 156. A stud 190 is rotatably uprightly mounted in ears 191a and 191b of bracket 184, generally transversely to link 156, for rotation about a vertical axis. Stud 190 includes a gear 192 at its lower end in meshing engagement with the gear 188 for rotation of stud 190 responsive to rotation of link 156. The upper end of stud 190 is provided with a multifaceted configuration or flats 194. The end of each link 154, 162, 164, 172 rotatably mounted in each related "defenseman" pivot assembly includes a gear 195 in meshing engagement with link gear 188 so that rotation of the defenseman link, such as 156, will cause rotation of the related wingman link, such as 154.

The player pivot assemblies 138 and 148 are substantially identical and typified by the structure of assembly 138 shown in FIG. 9. Thus, only this assembly will be described with the understanding that the description applies to assembly 148 as well. Assembly 138 includes a generally U-shaped bracket 196 which is connected to link 158 for to and fro movement with the link while permitting the link 158 to rotate relative to the bracket 196. Gear 198 is connected to link 158 for rotation therewith. An upstanding player supporting stud 200 is uprightly rotatably mounted in ears 201a and 201b of the bracket 196 generally transversely to link 158, for rotation about a vertical axis and includes a gear 202 at its lower end which is in meshing engagement with gear 198. Thus, stud 200 will rotate responsive to rotation of link 158. The free end of stud 200 preferably is also provided with a multifaceted configuration or the flats 204 as shown in FIG. 9.

The linkage control system for each of the several players further includes the master pivot assemblies 208, 210 and 212 positioned under one control area 30 and the master pivot assemblies 214, 216 and 218 positioned under the other control area 32. Pivot assemblies 210 and 216 are substantially identical and control the movements of the opposing simulated "centers." Pivot assemblies 208, 212, 214 and 218 are similar and each controls the movements of a simulated "defenseman" and simulated "wingman" of each team. Thus, the assemblies 208 and 212 control both "defensemen" and both "wingmen" for the team which is being controlled by a player adjacent the control area 30. Similarly, the pivot assemblies 214 and 218 control the "defensemen" and "wingmen" for the team which is being controlled by a player adjacent the control area 32.

Master pivot assembly 208 is typical of the assemblies 208, 212, 214 and 218. Thus, only this assembly will be discussed with the understanding that the description applies to assemblies 212, 214 and 218 as well. Included in the assembly is a generally U-shaped bracket 220 having a top portion 220a, and spaced, downwardly extending ears 220b and 220c. A stud 222 extends generally uprightly through the top portion 220a and is mounted for rotation to bracket 220 about a vertical axis. A hub portion 224 is connected to the lower end of stud 222 inside of bracket 220 and supports a gear 226. Gear 226 is positioned for rotation in a generally horizontal plane. Link 156 includes a sleeve 228 within bracket 220 and a gear 230 is fixed to sleeve 228. Link 156 is associated with bracket 220 for linear to and fro movement therewith while permitting rotational movement of the link 156 with respect to the bracket 220. Thus, as stud 222 is rotated, the link 156 will be rotated through the association of gear 226 and 230.

A master pivot assembly 210 typifies the structure of both assemblies 210 and 216, and only this assembly will be

described with the understanding that the description applies to assembly 216 as well. Included in this assembly is a generally U-shaped bracket 228 having a top 228a and opposed spaced ears 228b and 228c. A stud 230 extends generally uprightly through the top 228a of bracket 228 and is mounted for rotation about a generally vertical axis. The lower end of stud 230 is provided with a hub 232 and a gear 234 is connected to the hub 232 for rotation in a generally horizontal plane. Link 158 is connected to bracket 228 for to and fro movement with the bracket while allowing rotational movement of the link 158 relative to the bracket. A gear 236 is connected to the link 158 for rotation therewith in a generally vertical plane and is in meshing engagement with gear 234. Thus, as stud 230 is rotated, the link 158 will be rotated through the engagement of gears 234 and 236.

Each of the control areas 30 and 32 of the base 12 is provided with slots generally overlying the master pivot assemblies. Accordingly, in control area 30 elongate slots 238, 240 and 242 overlie master pivot assemblies 208, 210 and 212, respectively; and in control area 32, elongate slots 244, 246 and 248 overlie master pivot assemblies 214, 216 and 218, respectively. The stud portion of each of the pivot assemblies extends upwardly through each of the aforementioned slots and is secured to the previously identified knobs 128a through 132b. Specifically, studs 222 of the master pivot assemblies 208, 212, 214 and 218 are connected to the knobs 128b, 132b, 128a and 132a, respectively. Also studs 230 of the master pivot assemblies 210 and 216 are connected to the knobs 130b and 130a, respectively. Accordingly, any motion imparted to the aforementioned knobs will be transferred to the pivot assemblies and linkages to players associated therewith.

To provide a means for reducing the amount of linear motion necessary to be exerted on the master control knobs to move the players in a to and fro path, the hockey game of this invention is provided with linear motion amplification linkage assemblies 254 and 256, best seen in FIGS. 2 and 5 and also partially shown in FIG. 3. Each of the linkage assemblies 254 and 256 is substantially identical so that the parts of one such linkage assembly will be described with the understanding that the description applies to the other such linkage assembly as well.

Each linkage assembly includes a pair of generally L-shaped arms 258 and 260. Each of the arms includes transversely oriented portions 258a and 258b; and 260a and 260b, which meet at a juncture 258c and 260c, respectively. Furthermore, each of the portions 258b and 260b terminates in an offset end portion 258d and 260d, respectively. Portions 258a and 260a have forwardly offset hollow sleeves 262 and 264, respectively, formed thereon, with one sleeve, such as the sleeve 264 being generally concentrically related to the other sleeve 262 and slightly smaller in internal and external diameter.

A hub 266 having a first portion 266a of a size to matingly receive sleeve 262, a second reduced portion 266b of a size to matingly receive sleeve 264, and a third reduced portion 266c, depends from a bar 266d which is fastened, by means of screws 268 to the underside playing surface 28 in an area just forward of each of the goals 34 and 36. Linear motion amplification linkage assemblies 254 and 256 are connected to the underside of playing surface 28 by means of sleeve 262 being received on hub portion 266a reduced sleeve 264 being received on reduced hub portion 266b, and a fastener 270 being threadably received in the third reduced portion 266c of hub 266 with a washer 272 interposed between fastener 270 and the underside of sleeve 264, to thereby rotatably mount each of the arms 258 and 260 with respect to hub 266.

Straight link bars 274 and 276 extend from arms 258 and 260 to master pivot assemblies 208 and 212. Each of the link bars 274 and 276 has a short sleeve portion 278 at one end which is impaled by the studs 222 of each of the master pivot assemblies 208, 212, 214 and 218. At the opposite end, each of the straight link bars 274 and 276 is provided with a hollow hub 280 which overlies, and is pivotally connected to, an up-standing pin 282 provided on each of the arms 258 and 260 of

the juncture 258c and 260c, respectively. By this arrangement, the linear motion amplification linkage assemblies 254 and 256 are connected to each of the master pivot assemblies 208, 212, 214 and 218 for conjoint movement.

In addition, motion transmitting links 292 and 294 interconnect arms 258 and 260 with adjacent defenseman pivot assemblies. In particular, link 292 connects each arm 258 with the pivot assemblies 136 and 146 and link 294 connects each arm 260 with the pivot assemblies 140 and 150, respectively. As illustrated in FIG. 3, with respect to link 294, the opposite ends of the link are upturned as shown at 294a and downturned as shown at 294b. The upturned end of each link 292 and 294 extends through openings 295 and each of the offset ends 258b of each arm 258 and the upturned end of each link 294 extends through openings 296 in each of the offset ends 260d of the arms 260. The downturned end of each link 292 and 294 extends through an opening 298a in an ear 298 formed on each of the brackets 184 of each of the pivot assemblies 136, 140, 146 and 150. By this arrangement, the pivot assemblies 136, 140, 146 and 150 are connected to the L-shaped arms 258 and 260 of each of the linkage assemblies 254 and 256 for conjoint movement therewith.

As can best be seen with reference to FIG. 2, movement of any of the master pivot assemblies 208 or 212 will cause movement in the linkage assembly 254 and movement of any of the master pivot assemblies 214 and 218 will cause movement of linkage assembly 256. Each of these linkage assemblies is movable between a retracted position, as shown with respect to assembly 254 on the left-hand side of FIG. 2, and a fully extended position as shown with respect to assembly 256 on the right-hand side of FIG. 2. Because movement of one of the master pivot assemblies will cause movement of either one of the L-shaped arms 258 or 260, this will be translated as approximately twice as much linear or to and fro motion imparted to the defenseman pivot assemblies 136, 140 or 146, 150, through the connection of the links 292 and 294. Thus, the slots 238, 242, 244 and 248 need be approximately only half as long as the slots for the defensemen and wingmen players, namely slots 84, 86, 90, 92, 94, 96, 100 and 102, in that only a reduced amount of to and fro movement need be imparted to the master pivot control assemblies to accomplish approximately twice the amount of to and fro movement in the linkage assemblies to which these players are attached. This permits quicker movements to be imparted to the players and further permits the participants to be positioned closer to the game board in that the amount of to and fro movement which the participants must impart with their arms is significantly reduced compared to presently known hockey games of the type utilizing to and fro movement in a linkage system to accomplish corresponding movement in simulated players.

The game of this invention is further provided with a scoreboard assembly 300. Scoreboard assembly 300 includes complementary housing parts 302 and 304 which are joined together by suitable means, such as adhesive or the like to form an enclosure. Housing 302 has two depending legs 306 and 308 which terminate at reduced ends 306a and 308a, respectively, leaving a reduced shoulder 306b and 308b spaced above the terminus of the legs. Housing 304 also has two depending legs 310 and 312 which terminate in reduced pin end portions 310a and 312a. Apertures 314 are provided in the base 12 adjacent the fence 24 for receiving a pin portion 310a and 312a of the legs of housing part 304. As best seen in FIG. 17, with housing parts 302 and 304 assembled together, the assembly 300 is connected to the game base 12 with the pins 310a and 312a extending through the apertures 314 and reduced shoulders 306b and 308b abutting the top of fence 24, with the remainder of the leg portions, such as the reduced ends 306a, extending downwardly over the inner face of fence 24.

Housing 302 is provided with a central aperture 316 in the forward wall 318. A pair of ribs 320 and 322 are formed in the interior of the housing on either side of aperture 316 and are provided with short recesses 320a and 322a, respectively. A

puck release arm 324 extends through the aperture 316 between a distal end 324a and a proximal end 324b in the interior of housing 300. A generally crescentlike puck holding jaw 326 is provided at the distal end 324a of puck release arm 324. A transversely extending pivot pin 328 extends through the proximal end 324b of the arm 324 in the interior of the housing and occupies the recesses 320a and 322a in the ribs 320 and 322. A torsion spring 330 is connected to the pin 328 and biased between a connection 330a on arm 324 and a connection on the housing part 302 (not shown) to normally bias the arm 324 in an upward position as shown in FIGS. 1 and 3. It is intended that when a puck 126 is dropped therein the weight of the puck would cause the arm to slowly descend and dump the puck over the center area of the playing surface 28 for the accomplishment of the well known maneuver of the "faceoff."

A pair of discs 338 and 340 are provided in the interior of the housing 300 and are rotatably mounted about pins 342 and 344. Windows 346 and 348 are provided for viewing a portion of the discs which are intended to have numerical indicia 350, 352 thereon. As each team scores a goal, the disc may be manually rotated to indicate the score through the windows 346 and 348.

On the side of the base 12 opposite from the master scoreboard assembly 300 there is provided a timer housing 360 comprised of housing parts 362 and 364 which are generally similar in structure to the housing parts 302 and 304 of master scoreboard assembly 300. Parts 362 and 364 are connected together by suitable means, such as adhesive, to form an enclosure. It is intended that the housing 360 would be secured to the base 12 in generally the same fashion as the master scoreboard assembly 300. Thus, for this purpose the part 362 is provided with depending legs 366 and 368 which terminate in reduced pinlike ends 366a and 368a of substantially the same construction as the legs 310 and 312 of housing part 304. The other housing part 364 is intended to have substantially similar leg construction to that of housing part 302.

The forward wall 370 of housing part 364 is provided with a pair of openings 372 and 374 for receiving components of the timer mechanism as will be explained. Similarly, the rear wall 376 of housing component 362 is provided with component supporting bosses 378 and 380.

A timer mechanism 382 is supported within a C-shaped frame 384 and frame plate 384a in the interior of the housing 360. Timer mechanism 382 includes a winding shaft 386 which extends outwardly through opening 374 in wall 370 and which also is received in boss 380 on wall 376. A knob 386a is connected to winding shaft 386 at the exterior of the housing. A convoluted leaf spring 388 is connected to winding shaft 386 and has a free end 388a which abuts against frame leg 390.

Winding shaft 386 further includes a gear 392 and a wheel 393 to the exterior of the C-shaped frame 384. Wheel 393 has an outwardly projecting tab 393a which is in a position to strike a stop 394 which depends from the top of the interior of the housing 360.

Gear 392 is in meshing engagement with pinion 395 secured in the frame 384 on an axis generally parallel to the axis of shaft 386. Pinion 395 supports a gear 396 which is in meshing engagement with pinion 398, also secured in the frame 384 on an axis which is generally parallel to the other aforementioned axes. Pinion 398 supports a gear 400 which is in engagement with a pinion 401 also secured within the frame 384 about an axis parallel to the axis of the other pinion gears. Pinion 401 supports a five pronged star wheel 402 which is in engagement with a leaflike tongue member 404 pivotally mounted within the frame along shaft 405. Tongue 404 is adjacent circuit post 82a and includes a central offset portion 406 which is in a position to engage the back end of arm 408. Arm 408 is mounted on a rotatable shaft 410 which, at one end, is received within boss 378 and at the other end extends through opening 372 in wall 370 and has knob 372a secured to the exterior thereof. A stop member 412 projects outwardly from

the rear wall 376 in a position to engage arm 408 as shown in dotted outline in FIG. 15.

The timer mechanism 382 is connected, by means of wires 76 and 80 with the previously described circuitry of the game. The motor 70 includes a three pronged pinion 416 on the motor shaft which intermittently may engage a metallic leaf element 418 as the motor shaft rotates. Leaf element 418 is secured by fasteners 420 to base 12. The function of arm 408 is to provide an on-off capability to the timer mechanism. For this purpose, the exterior of the forward wall 370 is provided with indicia 422 indicating an "on" function and indicia 424 indicating an "off" function. As the knob 372a is rotated between these two positions, the arm 408 will be moved between the dotted outline and full outline positions in FIG. 14. The dotted outline position indicates the "on" function of the mechanism wherein movement of tongue 404 is permitted, and the full outline position indicates an "off" position, wherein movement of tongue 404 is prevented. In addition, the forward wall 370 includes a simulated clock 426 and the knob 386a includes a pointer 428. By reversely winding the knob 386a, the spring 388 is wound in proportion to the amount of time for which the timer is to run.

After the spring 388 is wound, the timer mechanism 382, through the aforescribed gears begins a step-by-step "countdown" until such time as the star wheel 402 moves the tongue 404 about its pivotal mounting into engagement with the post element 82a to complete a circuit and therefore start driving the motor 70. This will cause the pinions 416 to repeatedly strike the element 418 and produce a loud audible clicking sound, thereby indicating the end of a designated time period.

Timer mechanism 382 provides a unique arrangement for controlling an electric circuit to produce a signal. Instead of providing a rheostat or semiconductor, or the like, the simple spring wound timer permits the participants to select a preset interval of time as the duration for which the circuit will remain inactive until a signal is produced. The spring wound mechanism disclosed herein is inexpensive and reliable, and easily manipulated by participants of the game.

Posts, such as 178, 190, 200, 230, extend through mating square aperture 430 in disclike base 432. Base 432 includes an arm 434 having a slot 436 therein for receiving the simulated feet 438a and 438b of any one of the simulated players 104 through 120. Each of these simulated players further includes a tab portion 440 having aligned apertures 442a and 442b therein for emplacement by one of posts 178, 190, 200, 222, and 230. Thus, as these posts are rotated, or moved to and fro, the base 432 and arm 434 will be rotated, or moved to and fro, as will the simulated player connected thereto.

It can be seen that the hockey game of this invention provides unique advantages in the control of the simulated players through the described linkage arrangements. Participants may simultaneously control a defenseman and a wingman of each side of the playing surface. By this arrangement, six players may be controlled with but four knobs, reducing the number of control elements which must be selected during the rapid play of the game. Furthermore, the motion amplification assembly reduces the amount of to and fro movement which must be imparted to the master control in order to effect the desired amount of to and fro movement in the players. This arrangement makes for quicker action in the game and, because it reduces the space requirements for the movement of the master control, permits the participants to station themselves closer to the playing surface. Furthermore, unique goal signal means are provided for producing an audible signal to clearly indicate when a goal has been scored and the same sound producing means is associated with circuitry for providing a timer mechanism with the game. Finally, the unique one-piece molded construction of the base in its association with the separately received playing surface in the medial portion thereof provides a structure which is capable of inexpensive manufacture, simple assembly and extended durability.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, as some modifications may be obvious to those skilled in the art.

We claim:

1. In a game apparatus of the type having a base with a top and an underside, a playing surface on the top of the base having opposite sides and opposite ends, opposed goal areas on opposite ends of the playing surface, and playing elements movably mounted on the playing surface for to and fro, end to end, movement along the playing surface, an improved player control assembly comprising: a master player control manipulatable member movably associated with the base outside of the playing surface; a first player actuating link member extending from operable connection with said master control to operable connection with a player element mounted on said playing surface in an end thereof proximate to said master control; a second player actuating link extending from operable connection with said first link to operable connection with a second player element mounted on said playing surface in an end thereof distal from said master control, and a movement amplification assembly interconnected between said master control member and one of said player actuating links for imparting translational movement to at least one of the playing elements in excess of the amount of movement imparted to the master player control member, whereby manipulation of said master control will simultaneously affect movement of two playing elements in spaced apart positions on the playing surface.

2. The game apparatus of claim 1 wherein the player actuating links are interconnected to the playing elements by player pivot assemblies which transmit to and fro movement of the links to the player elements and translate pivotal movement of the links as pivotal movement to the playing elements.

3. The game apparatus of claim 2 wherein the movement amplification means is interconnected between the master control member and a player pivot assembly associated with the playing elements.

4. The game apparatus of claim 3 wherein the interconnection of the movement amplification means and the playing elements is with a player pivot assembly associated with a playing element in an end of the playing surface proximate to the master control member.

5. The game apparatus of claim 2 wherein the player actuating links are generally horizontally disposed relative to the playing surface and wherein the master control members are interconnected with the player actuating link by means of a master control pivot assembly including a shaft pivotal about a vertical axis relative to the playing surface so that rotation of the master player control member about a vertical axis will cause rotation of the link elements about a generally horizontal axis.

6. The game apparatus of claim 2 wherein the playing surface is provided with a plurality of slots therein and each playing element pivot assembly includes a rotatable shaft which extends through a slot, the shaft being rotatable about a vertical axis and wherein the second player actuating link extends generally horizontally from operable connection with a second player pivot assembly to operable connection with a first player pivot assembly and wherein the first player actuating link extends generally horizontally from operable connection with the first player pivot assembly to a master control pivot assembly, also including a shaft rotatable about a vertical axis; and wherein slots are provided in the base outside of the playing surface through which the master pivot playing assembly shaft elements extend so that rotation of the master control member about a vertical axis would be translated into movement of the player pivot assembly shafts and to and fro movement of the master player member will be translated into like movement of the player pivot shafts.

7. The game apparatus of claim 6 wherein said movement amplification assembly is connected to the underside of the playing surface and is interconnected between the master con-

trol pivot assembly and the player pivot assembly proximate thereto.

8. The game apparatus of claim 7 wherein the movement amplification assembly includes an arm having first and second portions transversely oriented relative to each other, with the first portion pivoted to the underside of the playing surface; a connecting arm extending from a pivotal connection with the juncture of the first and second portions to a pivotal connection with the master control pivot assembly; and a motion transmitting link extending from a pivotal connection with the free end of the second portion to a pivotal connection with the player pivot assembly proximate to said master control pivot assembly.

9. The game apparatus of claim 8 wherein the first portion of the arm of the movement amplification assembly is normally disposed generally transversely to the direction of to and fro movement of link elements and the second portion of said arm is normally disposed generally parallel to the direction of to and fro movement of the link elements.

10. The game apparatus of claim 1 wherein two master player control members are provided at each end of the base and each master player control member is associated with a first and second player actuating link member.

11. The game apparatus of claim 10 wherein each end of the base includes a center player control assembly medially positioned between the two master player control assemblies with the center player control assembly being operatively connected to a playing element positioned medially of the other playing elements in the adjacent end of the playing surface.

12. The game of claim 11 wherein a goal player control assembly is provided at each end of the base and is operatively connected with a goal player movably mounted in the goal area.

13. In a game apparatus of the type having a base with a top and an underside, a playing surface on the top of the base having opposite sides and opposite ends, opposed goal areas on opposite ends of the playing surface and playing elements movably mounted on the playing surface for to and fro, end to end movement along the playing surface; a master motion transmitting assembly mounted to the base for to and fro movement and including a generally uprightly oriented shaft relative to said playing surface to which a master control member is connected, with the master motion transmitting assembly including means for transmitting pivotal movement imparted to said upright shaft in another plane; a player motion transmitting assembly associated with players on the playing surface and associated with the playing surface for to and fro movement relative thereto and including a shaft generally uprightly oriented relative to the playing surface to which a playing element is connected, with means in the player motion transmitting assemblies for receiving pivotal motion in one plane and transmitting it as pivotal movement to said player upright shaft in a generally transverse plane; player actuating link members extending from operable connection and said master motion transmitting assembly to operable connection with said player member motion transmitting assembly and a player movement amplification assembly including an arm movably mounted to the underside of the base between a first retracted under center position and a second extended over center position; arm link means interconnecting the master motion transmitting assembly and the movable arm for pivotal movement of the arm responsive to to and fro movement of the master motion assembly and motion transmitting links means interconnecting the arm with the player motion transmitting assembly for movement of the player motion transmitting assembly responsive to movement of said arm, whereby as the master motion transmitting assembly is moved to and fro, the arm of the amplification assembly will be moved between the under center and over center positions to produce to and fro movements in said player motion transmitting assembly in excess of the amount of to and fro movement imparted to said master motion transmitting assembly.

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14. The game apparatus of claim 13 wherein two master motion transmitting assemblies are provided at each end of the base and each master player control member is associated with a first and second player actuating link member.

15. The game apparatus of claim 14 wherein each end of the base includes a center player control assembly medially positioned between the two master motion transmitting assemblies with the center player control assembly being operatively connected to a playing element positioned medially of the other playing elements in the adjacent end of the playing surface.

16. The game apparatus of claim 13 wherein the arm movably mounted includes first and second portions transversely oriented relative to each other, with the first portion pivoted to the underside of the playing surface; said arm link

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means extend from a pivotal connection with the juncture of the first and second portions to a pivotal connection with the master motion transmitting assembly; and said motion transmitting link means extends from a pivotal connection with the free end of the second portion to a pivotal connection with the player motion transmitting assembly proximate to said master motion transmitting assembly.

17. The game apparatus of claim 16 wherein the first portion of the arm of the movement amplification assembly is normally disposed generally transversely to the direction of to and fro movement of the arm link means and the second portion of said arm is normally disposed generally parallel to the direction of to and fro movement of the arm link means.

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