

[54] **MAGNETIC HOCKEY GAME**

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[58] Field of Search **273/1 M, 85 F, 86 B, 94 R,**
273/94 F, 108, 118 A; 46/239, 240

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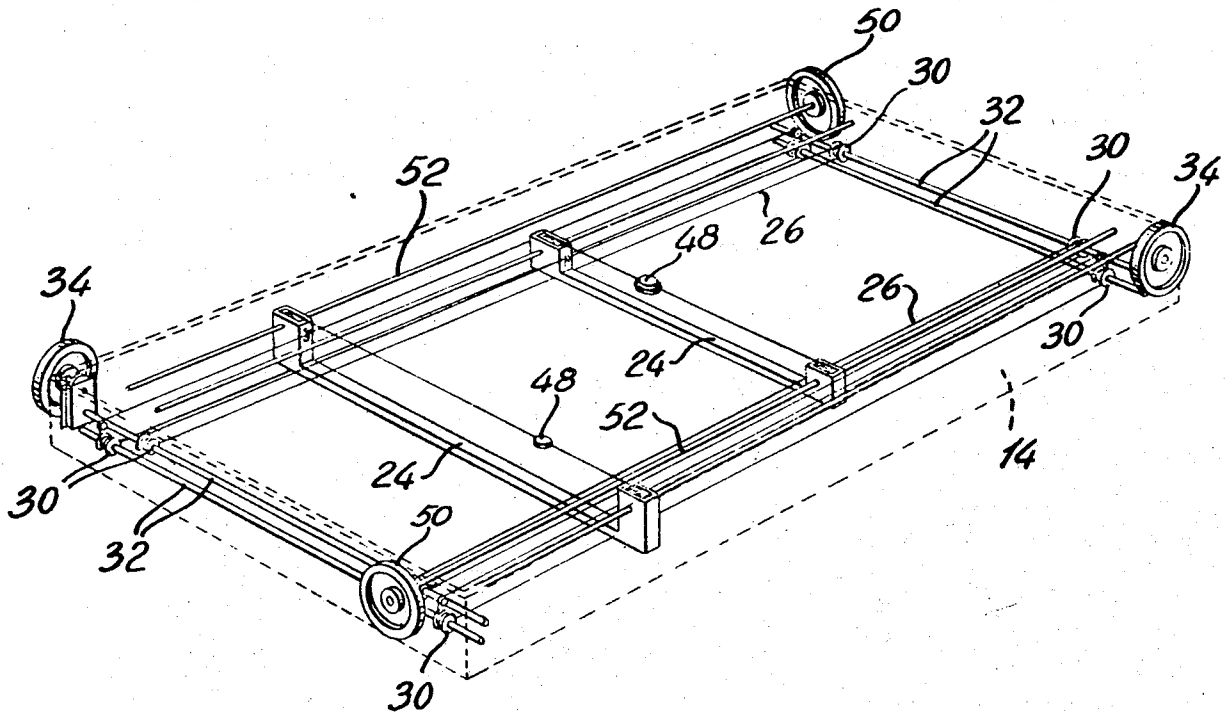
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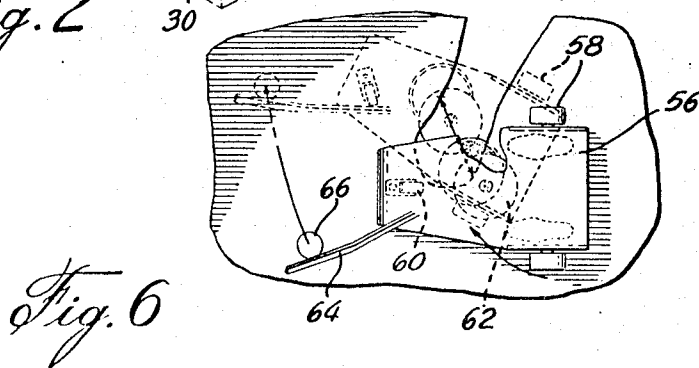
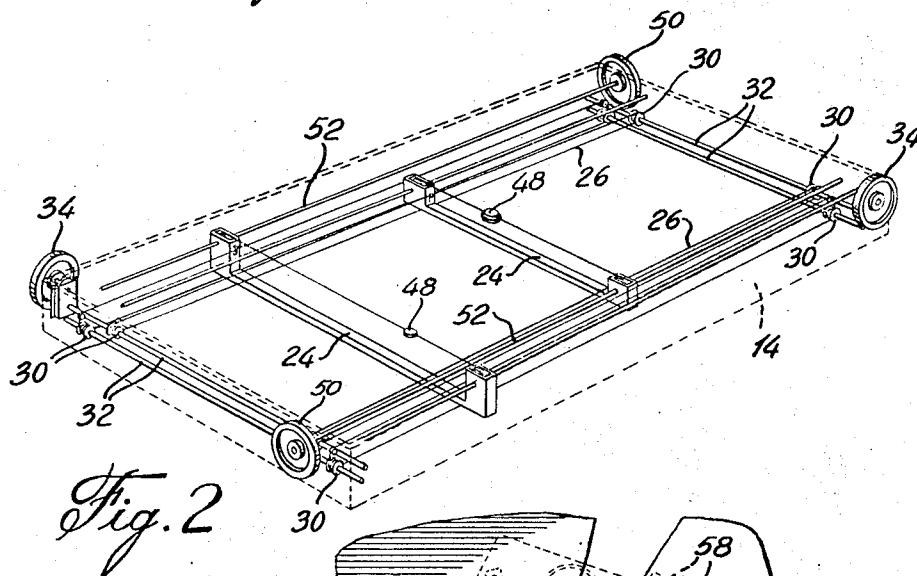
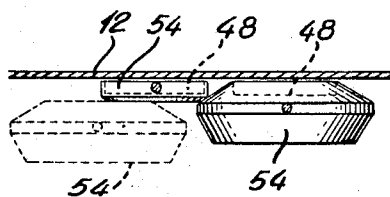
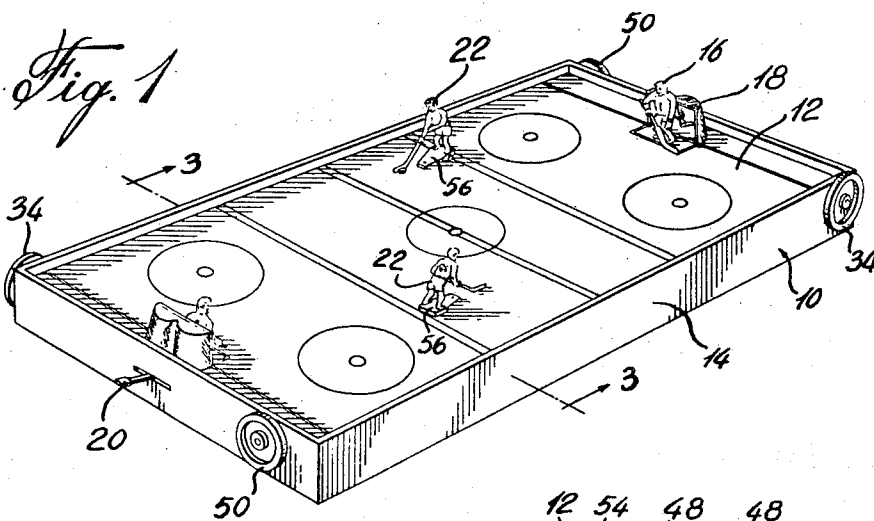
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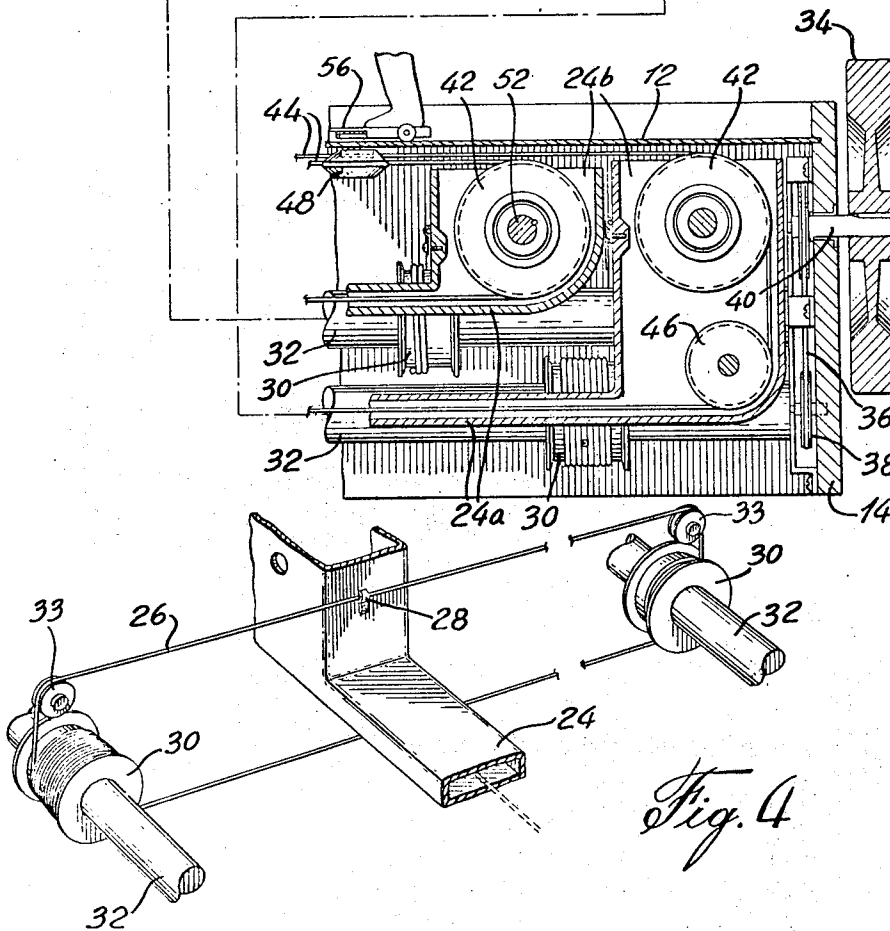
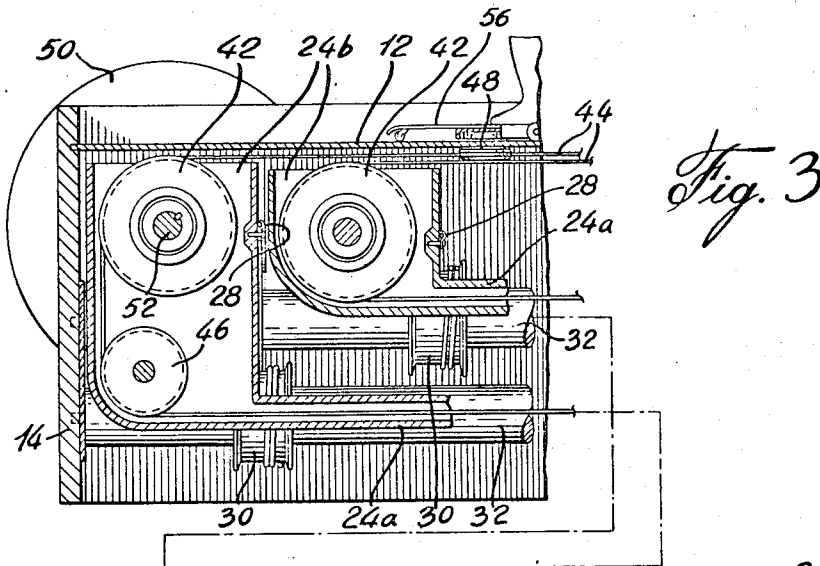
[57] **ABSTRACT**

A game apparatus comprising a playing surface made of non-magnetic material upon which are placed a plurality of magnetic game pieces. The game apparatus is surrounded by a frame and a plurality of transverse members are positioned underneath the playing surface and moved in both directions along the longitudinal axis thereof. A magnet is associated with each one of the transverse members and cables and pulleys are provided for moving the transverse members longitudinally of the playing surface and for moving the magnets transversely of the playing surface. At least one of the transverse members is mounted for movement within other transverse members so that each transverse member can travel the full length of the playing surface. The above arrangement permits each magnet to move one of the game pieces placed on the playing surface longitudinally and transversely on such playing surface.

9 Claims, 6 Drawing Figures







MAGNETIC HOCKEY GAME

The invention relates to a game apparatus and more particularly to a game apparatus using miniature players such as hockey, soccer or football players positioned and moved on a playing surface to simulate a real game.

In the known game apparatus, such as the so-called hockey games, the miniature players are limited in their movements either to a simple rotational movement on the playing surface or only permitted a minimum amount of displacement. This inflexibility in the movements of the miniature players often fails to maintain the players interest in the game. Attempts have been made to improve the game apparatus of this type by using magnetically actuated miniature players to provide a greater degree of movement of the players on the playing surface. However, the known game apparatus, such as the one disclosed in U.S. Pat. No. 3419271 issued Dec. 31, 1968, for example, are too complex to have any significant commercial value.

It is the object of the present invention to provide a magnetically actuated game apparatus which is of simple construction and therefor less expensive to manufacture.

The game apparatus, in accordance with the invention, comprises a non-magnetic playing surface upon which are placed a plurality of game pieces and a plurality of transverse members positioned underneath such playing surface and adapted to be moved freely in both directions along the full longitudinal axis of the playing surface. A magnet is associated with each of the transverse members and means are provided for moving such magnets transversely of the playing surface. The above arrangement permits each magnet to move one of the game pieces placed on the playing surface longitudinally and transversely on such playing surface.

The means for moving each transverse member along the longitudinal axis of the playing surface may comprise an endless cable attached to the transverse member, a pulley rotatably mounted at each end of the playing surface for supporting the cable, and means for rotating one of the pulleys to drive the cable and so move the transverse member.

The means for moving each magnet transversely of the playing surface may comprise an endless cable upon which the magnet is secured, a pulley rotatably mounted at each end of the transverse member for supporting the cable, and means for rotating one of the pulleys to drive the cable and so move the magnet.

The driving pulleys for moving each transverse member longitudinally of the playing surface and for moving each magnet transversely of the same playing surface are operated by the players through control wheels. Such control wheels have a certain weight so as to act as flywheels to impart a predetermined momentum to the transverse members or the magnets in response to a rotational impulse given to the control wheels by the players.

The invention will now be disclosed with reference to a preferred embodiment thereof and to the accompanying drawings in which:

FIG. 1 illustrates a prospective view of the top portion of the game apparatus;

FIG. 2 illustrates an over-all prospective view of the operating mechanism of the game apparatus;

FIGS. 3, 4, illustrate detail views of the operating mechanism of the game apparatus;

FIG. 5 illustrates the structural arrangement of the magnets of the game apparatus; and

FIG. 6 illustrates a game piece which may be used with the apparatus in accordance with the invention.

Referring to FIG. 1, there is shown a game apparatus 10 comprising a playing surface 12 held by a surrounding frame 14. The playing surface 12 simulates a real ice rink upon which miniature hockey players are placed and moved. It is to be understood that other types of playing surfaces could be used depending on the game it is desired to simulate. The miniature players are made of or carry pieces of magnetic material for a purpose to be disclosed later. The embodiment illustrated in the drawings includes two players 16 placed in front of goals 18 and each mounted for swivel movement in front of a goal by means of handle 20. Two movable players 22 are placed and adapted to be moved on the playing surface 12.

Referring to FIGS. 2 to 4, each miniature player 22 is moved by means of a U-shaped transverse member 24. The transverse members are mounted for movement one within the other so as to permit movement of the transverse members the full length of the playing surface 12. Each transverse member 24 is moved by means of an endless cable 26 which is secured to the transverse member by means of a clamp 28. The endless cable is wound a predetermined number of turns around two pulleys 30 mounted on shafts 32 so as to permit the transverse member to move the full length of the table while preventing sliding of the cable on the pulleys. This way, the transverse members are always kept parallel to the ends of the table. The endless cable also passes around two spacing pulleys 33 which are slidably mounted on a supporting shaft so as to permit winding of the cable on the pulleys 30. The shafts 32 are rotatably mounted in the frame 14 and one of them is driven by a control wheel 34 which is coupled to the shaft through a belt 36 passing around two pulleys 38, one of which is keyed to the shaft 32 and the other to the shaft 40 which is itself keyed to the control wheel 34. The control wheel is made of heavy material in order to act as a flywheel to impart a momentum to the transverse member 24 which will permit the transverse member to move a substantial distance along the playing surface 12.

The transverse U shaped members 24 have a hollow horizontal portion 24a and two vertical leg portions 24b. A pulley 42 is rotatably mounted within each leg portion 24b of the transverse member 24 and an endless cable 44 is supported by such pulleys. The lower transverse member further comprises a second set of pulleys 46 for spacing the cable 44 because of its longer leg portions 24b. The pulleys 42 and 46 have a V shaped groove 45 therein for preventing sliding of the cable with respect to the pulley.

The lower portion of cable 44 passes through the hollow portion 24a of the transverse member 24 and the upper portion thereof holds a magnet 48. The magnet 48 is moved across the playing surface by means of a control wheel 50 which is coupled to one of the pulleys 42 through a shaft 52. Such shaft has a groove 47 therein extending the full length thereof and the pulley 42 is coupled to the shaft by means of a protrusion slidably engaged into the groove. The other pulley 42 is rotatably mounted on a sleeve 51 secured to the trans-

verse member and supported by a shaft 53 extending the full length of the playing surface. It is to be understood that the groove 47 in shaft 52 is to permit longitudinal movement of the transverse members during the transverse movement of the magnets. Control wheel 50 is made of heavy material in order to act as a flywheel in the same manner as control wheel 34.

It will be easily understood that the upper transverse member 24 has a shorter portion 24a so as to permit the transverse member to move inside the legs 24b of the lower transverse member. This way, each transverse member is movable along the full length of the playing surface. Furthermore, the leg portions 24b of the upper transverse member are shorter than the corresponding leg portions of the lower transverse member and the pulleys 42 thereof are arranged in such a way as to permit the upper portion of the endless cable 44 to move underneath the corresponding upper portion of the cable 44 of the lower transverse member, again so as to prevent interference in the movement of one of the transverse members by the other.

The cables 44 may be made of nylon or other similar materials. They may also be made of stainless steel or other non-magnetizable materials. A stainless steel wire of 5 thousand of an inch in diameter has been experimented and found satisfactory.

Referring to FIG. 5, the magnets 48 are positioned in a casing 54 and the casing of the magnet associated with the upper transverse member is shaped in such a way as to permit such casing to pass under the casing of the other magnet if they happen to contact each other during the game, or under the cable of the lower transverse member.

Referring to FIG. 6, each miniature hockey player is mounted on a carriage 56 having two back wheels 58 and a swivel front wheel 60. The back wheels 58 are freely mounted on thus supporting shaft so as to permit easy pivotal of the carriage about a point approximately midway between the two wheels. A piece of magnetic material 62 is secured to the carriage 56 and is so positioned that the stick 64 of the miniature hockey player is maintained substantially forward of the player during the movement of the carriage by the magnet 48.

In operation, the hockey player 22 is moved along the playing surface 12 by displacing the transverse member 24 longitudinally of the playing surface and the magnet 48 transversely of the playing surface until such magnet 48 attracts the piece of magnetic material 62 of the carriage 56. The movement of the transverse member 24 and of the magnet is controlled by control wheels 34 and 50 of each player. To simulate a real game, the control wheels 34 and 50 are rotated in such a way as to permit a player 22 to carry a puck 66 towards the goal of the opposite player.

During movement of the player 22 towards the goal of the opposite player, the magnet 48 may be oscillated as illustrated in FIG. 6 of the drawings so as to simulate the movement of a real hockey player carrying the puck 66 towards the goal.

Of course, the opposing player may prevent the player carrying the puck 66 from reaching the goal by placing himself in front of the player as in the real game or by trying to take the puck away from the opposing player with his stick.

Although the invention has been disclosed with reference to a hockey game, it is to be understood that the

operating mechanism disclosed may also be used with other types of games. It is also to be understood that the structure illustrated may be modified and that the scope of the invention is to be limited only by the appended claims.

I claim:

1. A game apparatus comprising:

- a. a plurality of magnetic game pieces;
- b. a non-magnetic surface for supporting said game pieces;
- c. a plurality of transverse members positioned underneath and transversely of said playing surface, at least one of said transverse members being mounted for movement within the other transverse members so as to permit each transverse member to travel the full length of the playing surface;
- d. means for moving each transverse member in both directions along the longitudinal axis of said playing surface;
- e. a magnet linked with each one of said transverse members; and
- f. means for moving such magnet transversely of said playing surface, thereby permitting each magnet to move one of the game pieces placed on said playing surface longitudinally and transversely on said playing surface.

2. A game apparatus as defined in claim 1, wherein said means for moving each transverse member along the longitudinal axis of said playing surface comprises an endless cable attached to the transverse member, a pulley rotatably mounted at each end of the playing surface for supporting the cable, and means for rotating one of said pulleys to drive said cable and so move the transverse member.

3. A game apparatus as defined in claim 2, wherein said means for rotating said one pulley is a control wheel made of heavy material so as to impart a predetermined momentum to said transverse member.

4. A game apparatus as defined in claim 1, wherein said means for moving each magnet transversely of the playing surface comprises an endless cable upon which the magnet is secured, a pulley rotatably mounted at each end said transverse member for supporting said cable, and means for rotating one of said pulleys to drive said cable and so move said magnet.

5. A game apparatus as defined in claim 4, wherein said means for rotating said one pulley comprises a control wheel of heavy material so as to impart a predetermined momentum to said magnet.

6. A game apparatus as defined in claim 1, wherein said transverse members are U-shaped.

7. A game apparatus as defined in claim 6, wherein the cables supporting the magnets are spaced from the bottom surface of the playing surface a distance such as to permit the magnets to attract the game pieces while preventing interference of the magnets with respect to each other.

8. A game apparatus as defined in claim 7, wherein each of the magnets are positioned in individual casings and wherein said casings are of a shape such as to permit their relative movement when they come in contact with each other.

9. A game apparatus as defined in claim 1, wherein each game piece is made in the shape of a hockey player holding a stick, and wherein said hockey player is mounted on a carriage having two back wheels and a front swivel wheel, said carriage carrying a piece of magnetic material which is positioned on the carriage between said back and front wheels to maintain the stick of the hockey player substantially forward during movement of the carriage.

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