May 26, 1964 H. MONIGAL 3,134,593

VARIABLE GEAR GAME

Filed Sept. 7, 1962 2 Sheets-Sheet 1

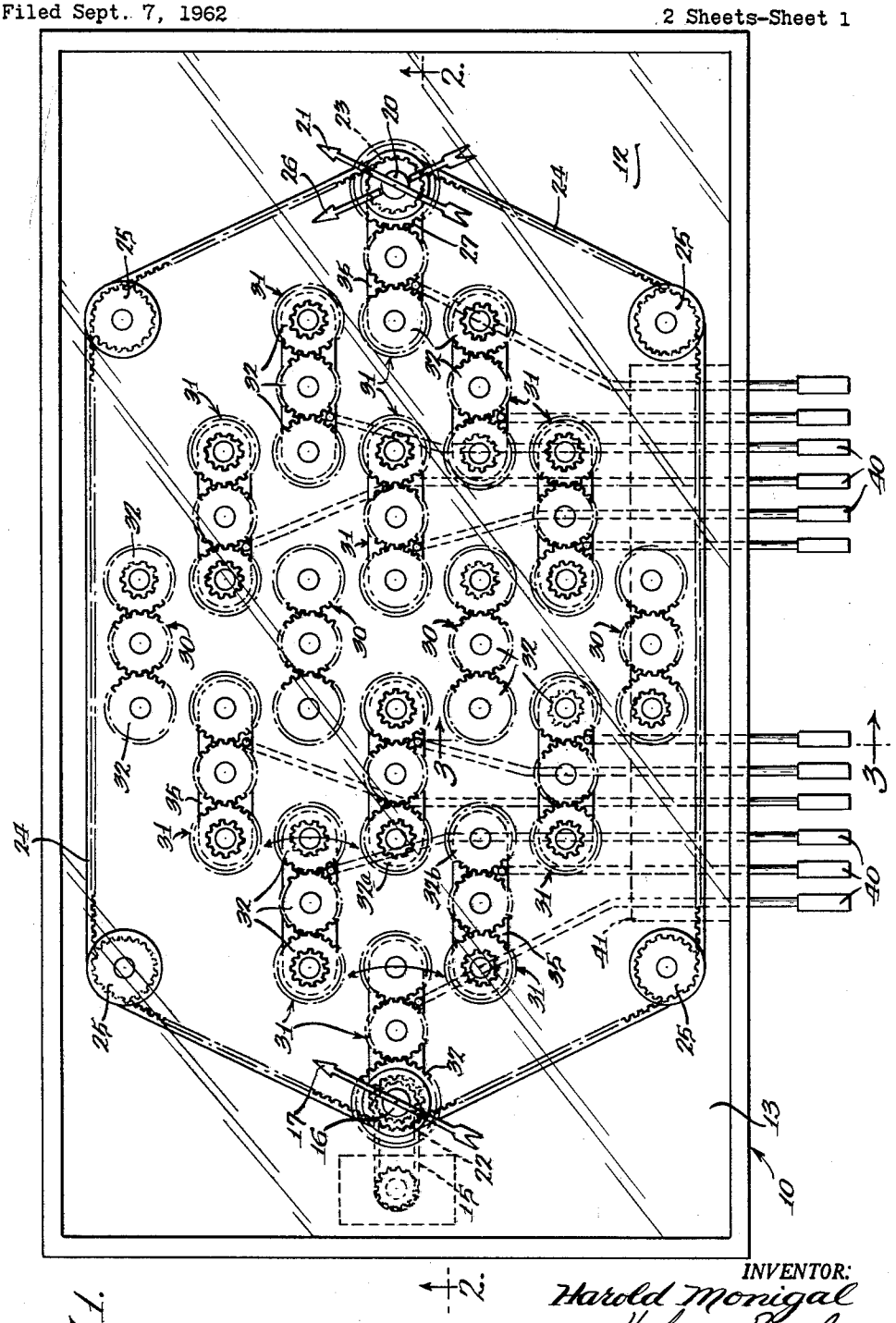


FIG. 1.

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May 26, 1964 H. MONIGAL 3,134,593

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Filed Sept. 7, 1962 2 Sheets-Sheet 2

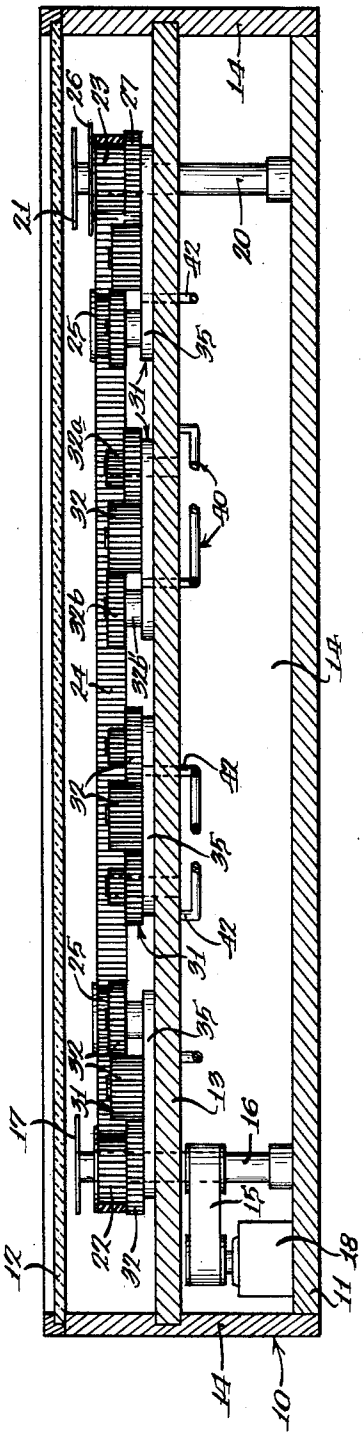


Fig. 2

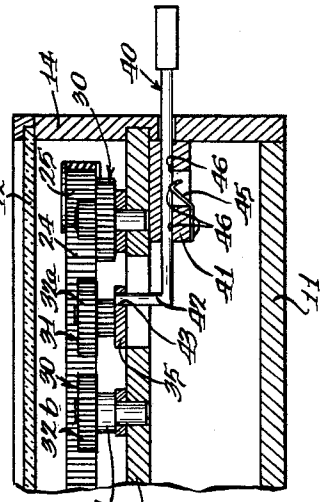


Fig. 3

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VARIABLE GEAR GAME

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This invention relates to an amusement device, and more particularly to a game of skill.

The primary object of this invention is to provide a new and improved game.

Another object is to provide a new and improved game of skill.

A further object is provision of a new and improved game operable in a manner which is interesting to watch. A related object is provision of such a game having interesting mechanical drives visible to spectators and operable by a player.

A more specific object is provision of a game having movable indicators, operation of one of the indicators being adjustable by a player who attempts to synchronize operation of the indicators.

Other objects and advantages of the invention will become readily apparent from the following detailed description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a plan view of a preferred embodiment of the invention;

FIGURE 2 is a vertical sectional view taken generally along the line 2—2 of FIGURE 1; and

FIGURE 3 is a fragmentary vertical sectional view taken generally along the line 3—3 of FIGURE 1.

While an illustrative embodiment of the invention is shown in the drawing and will be described in detail herein, the invention is susceptible of embodiment in many different forms, and it should be understood 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. The scope of the invention will be pointed out in the appended claims.

The illustrated embodiment of the invention is, in brief, directed to a game having indicators, at least one of which may be operated in various manners, the object of the game being to operate the indicators in a harmonious or synchronous manner. A chain drives one of the indicators in a constant manner, and a plurality of gear sets are manually adjustable by a player thus providing different gear ratios, at least one of these gear ratios causing all indicators to be driven in synchronization. The chain drive and gear sets provide a novel operating pattern and are visible to both player and spectator so as to attract and hold attention.

Referring to the drawings, the game includes a body in the form of a box **10** having a bottom **11** and a transparent top **12** with a horizontal base **13** between the top and bottom and enclosed by suitable side walls **14**.

A suitable motor **18** is connected by a belt drive **15** with a vertical rotatably mounted shaft **16** seated on bottom **11** and extending upwardly through base **13**. Fixedly secured to the upper end of shaft **16** is an indicator **17**, here in the form of an arrow which rotates with the shaft responsive to operation of motor **18**. At an opposite end of the base a second vertical rotatably mounted shaft **20** is seated on bottom **11** and extends upwardly from the base with an indicator **21**, also shown in the form of an arrow, fixedly secured to the top end of shaft **20**. A chain sprocket **22** is mounted on shaft **16** for rotation therewith and a chain sprocket **23** is freely received on shaft **20**, and carries an arrow **26** rotatable concentrically with the arrow **21**. A continuous chain **24** drivingly engages each sprocket and passes around idlers **25** along edge portions of base **13** for driving arrow **26** at the same rate of speed as arrow **17**. A chain and sprocket drive is preferable in order to attract and hold interest in the game, but other drives such as pulleys and belts might be provided if desired.

Shaft **20** is driven by a gear **27** mounted thereon to rotate indicator **21** on the upper end of the shaft. An object of the game is to cause arrow **21** to rotate at the same speed as arrow **26** which is rotating at the same speed as arrow **17** at the other end of the base, and if desired, to adjust arrows **21** and **26** to rotate in alignment. To this end, a plurality of gear sets of various gear ratios are provided for driving gear **27** responsive to rotation of shaft **16**. In the illustrated embodiment a plurality of stationary gear sets **30** extend transversely across the center of base **13**, and movable gear sets, as **31**, are arranged in generally triangular patterns extending from the row of stationary gear sets **30** toward either end of base **13**. Movable gear sets **31** may be moved between positions in engagement with any one of two adjacent gear sets, either stationary or movable, and a position out of engagement with these adjacent gear sets. Each gear set, in the illustrated embodiment, includes a series of three gears, generally designated **32**, and these gears may be of various sizes and types, as will appear hereinafter.

Gears **32** are each mounted on a shaft and the gear shafts of the stationary gear sets **30** are mounted directly on base **13**. The shafts of movable gear sets **31** are each mounted on a carrier **35**, and one of the shafts at an end of each gear set pivotally connects its carrier **35** with base **13** for pivotal movement of the gear at the opposite end of the carrier into and out of engagement with any one of two adjacent gear sets, as indicated by the arrows in FIGURE 1. It should be noted that shafts **16** and **20**, at opposite ends of base **13**, are each part of a respective movable gear set and serve in pivotally mounting the respective carriers. A gear **32** is secured to shaft **16** for rotation therewith, thus defining a driving gear set which may be moved into or out of engagement with any one of two adjacent gear sets, as previously described. Similar movement of other movable gear sets **31** provides a driving linkage to an ultimate driven gear set including shaft **20** and arrow **21**.

As may be best seen in FIGURES 2 and 3, gears **32** may be of various sizes and types, for example, a multiple gear **32***a* may be provided with two diameters, a smaller diameter engaging one cooperating gear set, and a larger diameter engaging the other cooperating gear set. Similarly, a gear **32** may be of a type such as that shown at **32***b* wherein a blank portion **32***b'* permits a toothed portion of the gear to engage gears of other gear sets without interference.

Each of the movable gear sets **31** is provided with manually actuated means for moving the gear sets into and out of engagement with adjacent gear sets. In the illustrated embodiment, the manual actuating means is in the form of levers **40**, one for each movable gear set **31**. As may best be seen in FIGURE 3, each lever is slidably mounted in a block **41** secured to body **10**, and has an upstanding finger **42** seated in a socket **43** in carrier **35**, this socket being spaced from the pivotal axis of the carrier. Thus, by sliding a lever **40** inwardly or outwardly the respective gear train is moved into or out of engagement with a cooperating gear set. Means for retaining lever **40** in adjusted position is here provided in the form of a detent **45** secured to block **41** and releasably seated in any one of three notches **46** in lever **40**, the center notch corresponding to the disengaged position of the respective gear set, and the two end notches corresponding to engaged positions.

In order to rotate arrow **21** a series of gear sets must be in engagement between the driving gear set at the left

end of FIGURE 1 and the driven gear set at the right end of FIGURE 1.

The gear ratios of the various gear sets are such that at least one driving series of gear sets will drive arrow **21** at the same speed as arrow **26**. In order to have arrows **21** and **26** rotate in alignment when they are rotating at the same speed, it is merely necessary to disengage one of the gear sets of the driving gear train and skillfully again engage this gear set.

Obviously, when it is desired to utilize this game commercially, a suitable coin-operated actuated mechanism may be provided, and other suitable mechanism may be provided for stopping operation of the game upon completion of the objective or expiration of a predetermined period of time.

By providing a transparent top **12**, interest in the game is stimulated by the novel arrangement of gear sets **30** and **31**, and the chain drive which encircles and frames these gear sets.

I claim:

1. A gear comprising: a base; gear sets, each including a gear train, at least some of said gear trains having large and small gears for selectively engaging another gear train, said gear sets including a driving set and a driven set, some of said gear sets being stationary and other gear sets being movable on said base, the movable gear sets having carriers; means mounting the carriers on said base for movement of the respective gear train between engaged and disengaged positions with another gear train; a sprocket concentric with a gear of said driving set and rotatable with the driving set gear train; a sprocket concentric with a gear of said driven set and rotatable independently of said driven set gear train; a continuous chain drivingly engaging with said sprockets; arrows, one mounted for rotation with each of said sprockets and said driven gear set, the arrows connected with said driven set gear train and driven set sprocket being rotatable about concentric axes; and manually operable means for independently moving said carriers between said positions to selectively engage at least a portion of said gear sets in various combinations for varying the speed of rotation of said driven set sprocket and in at least one such combination driving the last said arrow at the same speed as the other arrows.

2. A game comprising: a base; a first indicator rotatably mounted on said base; a pair of indicators mounted on said base away from said first indicator for independent rotation about concentric axes; means for rotating said first indicator and one of said pair of indicators at the same speed; drive means responsive to rotation of said first indicator for rotating the other of said pair of indicators at selectively variable speeds; and means including a plurality of manually operable members movable to different combinations of setting for adjusting said drive means to vary the speed of said other indicator and at least one such setting rotating all said indicators at the same speed.

3. A game comprising: a base; a pair of indicators mounted on said base for independent rotation; means for rotating a first of said indicators; drive means responsive to rotation of said first indicator for rotating the other indicator at selectively variable rates, said drive means including a plurality of multiposition connectors to control the rotation of said other indicator and at least one such position rotating said indicators at the same rate.

4. In the game of claim 3, said drive means comprising gears, and means mounting said gears on said base for engagement and disengagement with other ones of said gears to vary the speed of said other indicator.

5. In the game of claim 3, said drive means comprising gear sets, at least some of said gear sets being movable on said base, the movable gear sets having carriers, and means mounting the carriers on said base for movement of the respective gear sets between engaged and disengaged positions with other of said gear sets.

6. In the game of claim 3, said drive means comprising gear sets each including a gear train, at least some of said gear trains having large and small gears for selectively engaging another gear train, some of said gear sets being stationary and other gear sets being movable on said base, the movable gear sets having carriers, and means mounting the carriers on said base for movement of the respective gear train between engaged and disengaged positions with other of said gear trains.

7. A game comprising: a base; a pair of indicators mounted on said base for independent movement in given paths; means for moving a first of said indicators in its path; adjustable drive means responsive to movement of said first indicator for moving the other indicator at selectively variable speeds; and a plurality of manually operable multiposition connectors movable to various positions to control the movement of said other indicator and in at least one such position to drive said second indicator at the same speed as said one indicator.

8. A game comprising: a base; a first indicator rotatably mounted on said base; a second indicator mounted on said base for independent rotation; means for rotating said first indicator; drive means responsive to rotation of said first indicator for rotating said second indicator at a selected one of a plurality of rates; and a plurality of manually operable multiposition members forming a part of said drive means and movable to different combinations of positions for adjusting said drive means to vary the rotation of said second indicator, the indicators rotating at the same rate with at least one combination of positions of said members.

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