

**April 10, 1951**

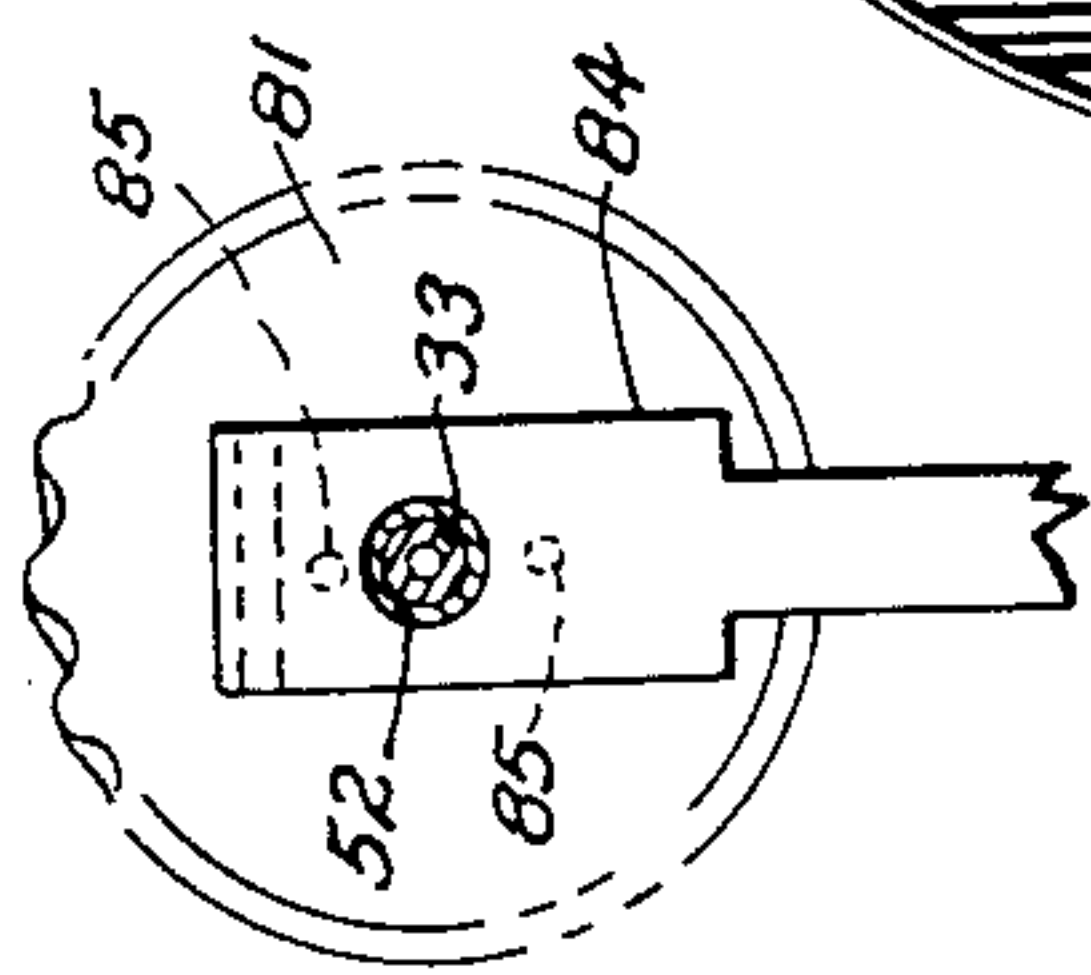
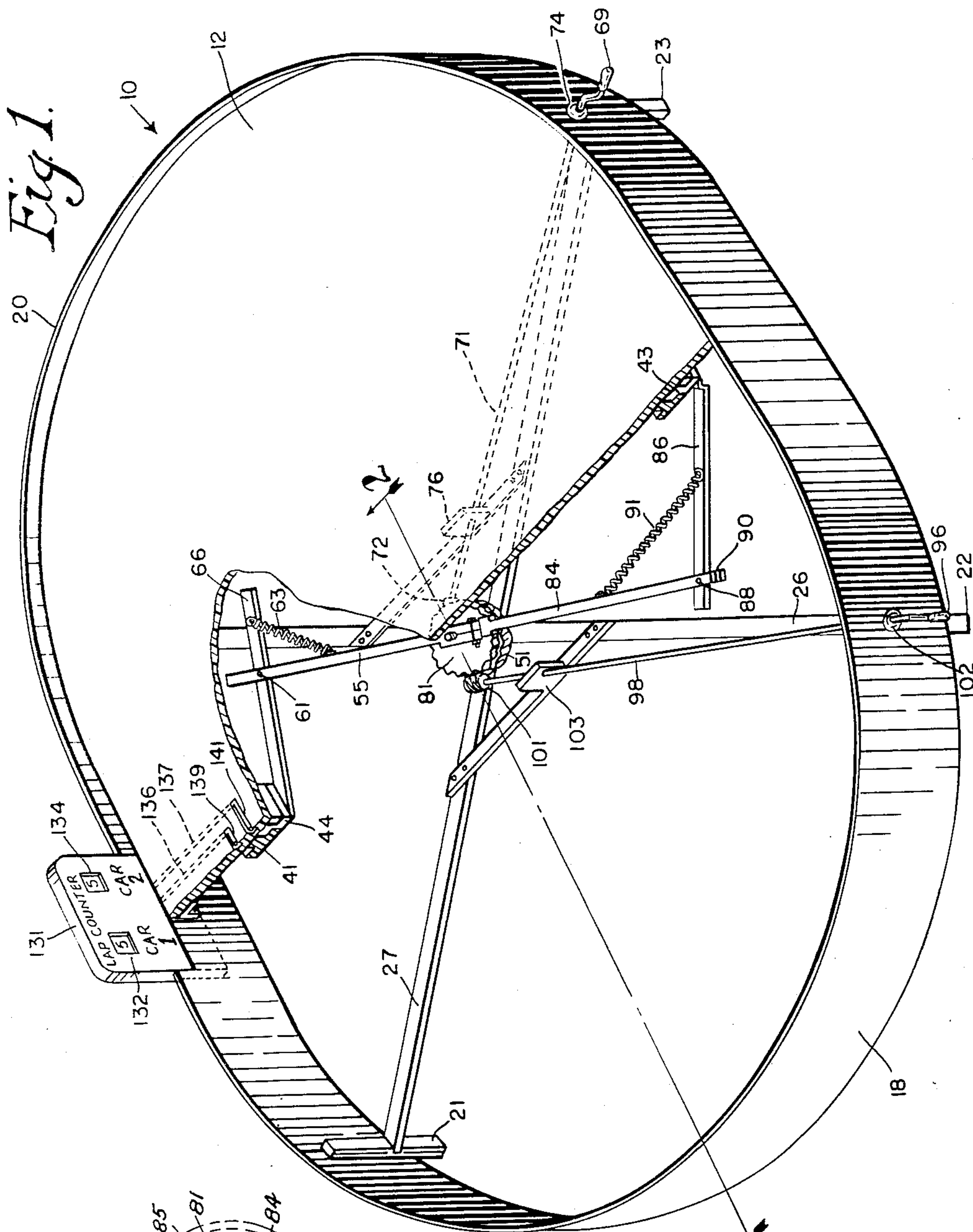
R. L. ROBINS

**2,548,495**

MAGNETIC RACING GAME DEVICE

Filed July 9, 1947

2 Sheets-Sheet 1



INVENTOR.  
Russell L. Robins  
BY  
Henry Ruhl  
Attorney

April 10, 1951

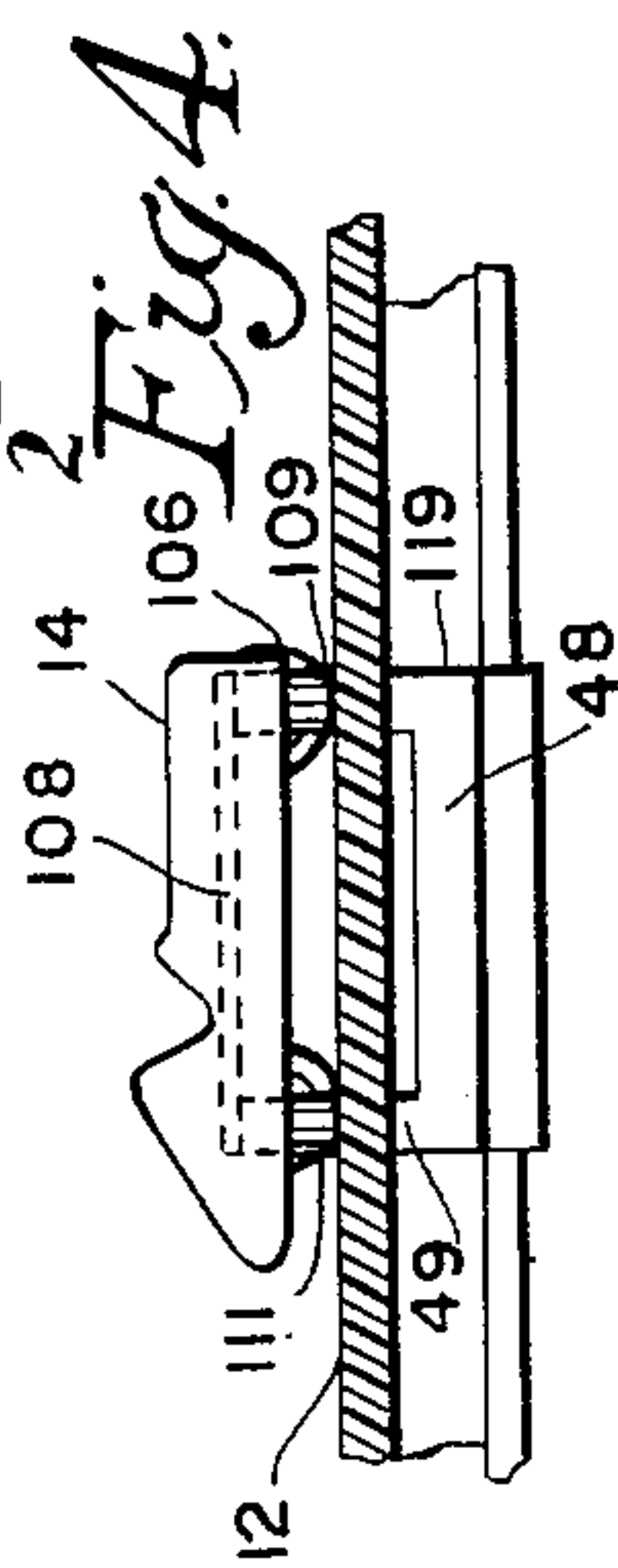
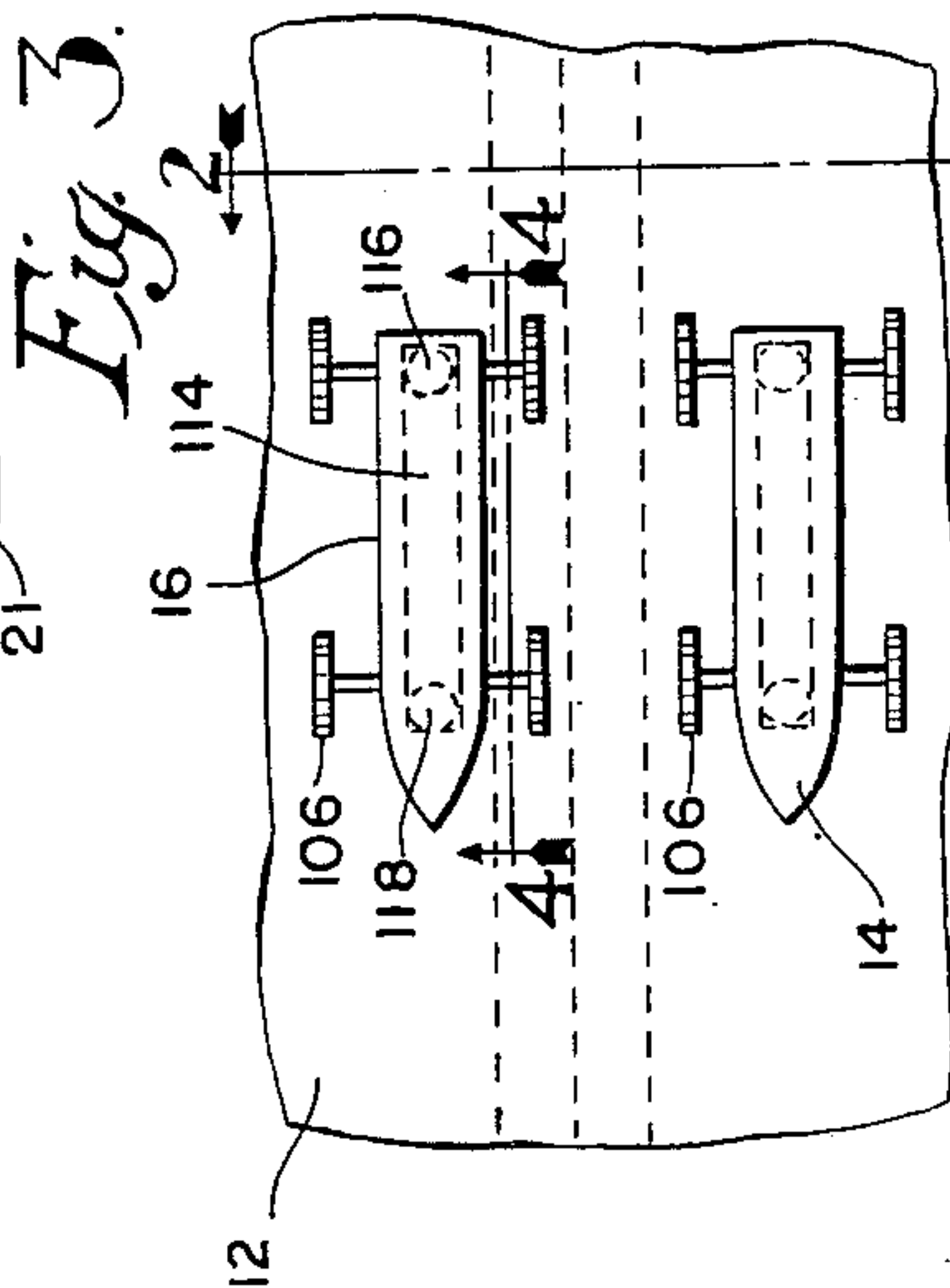
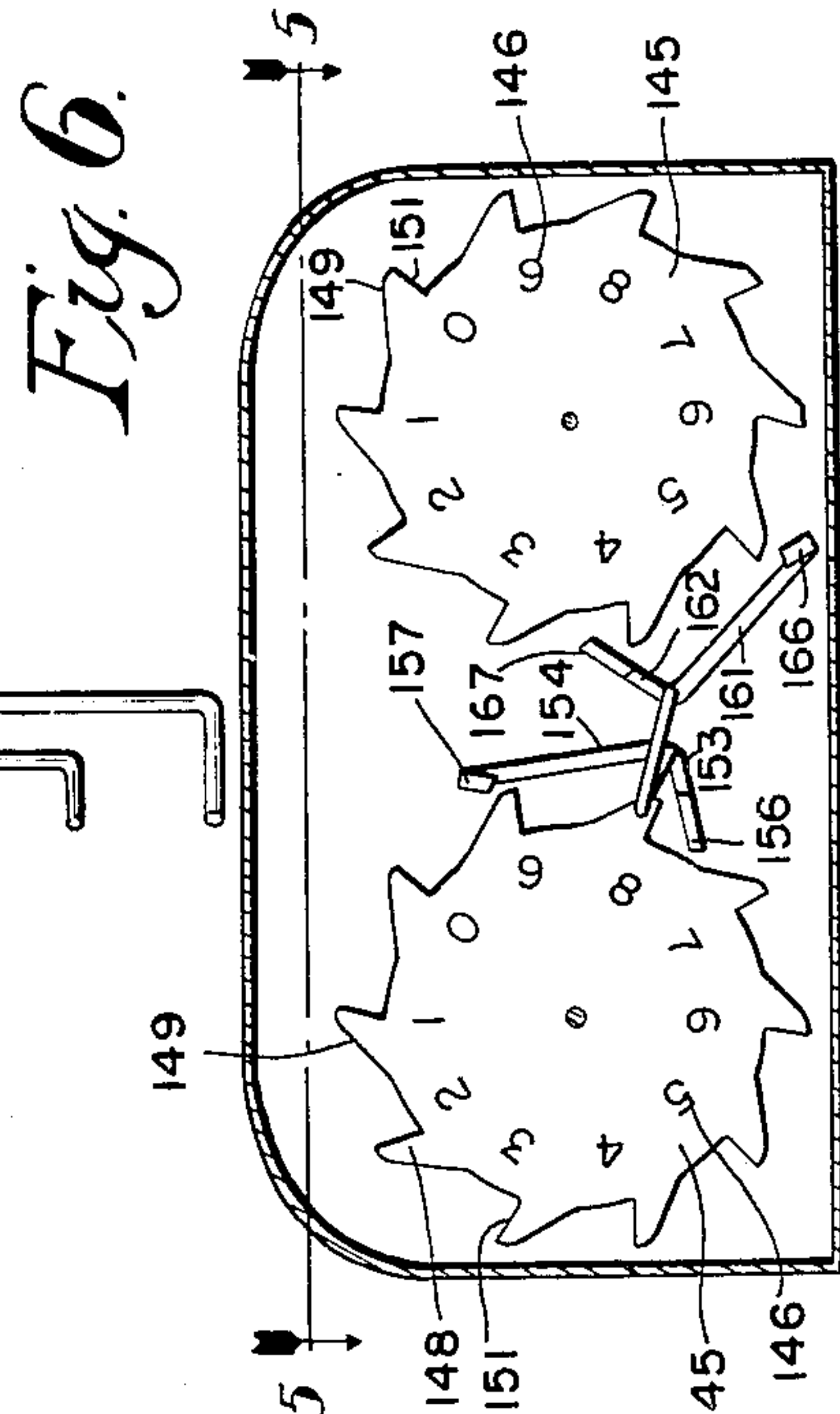
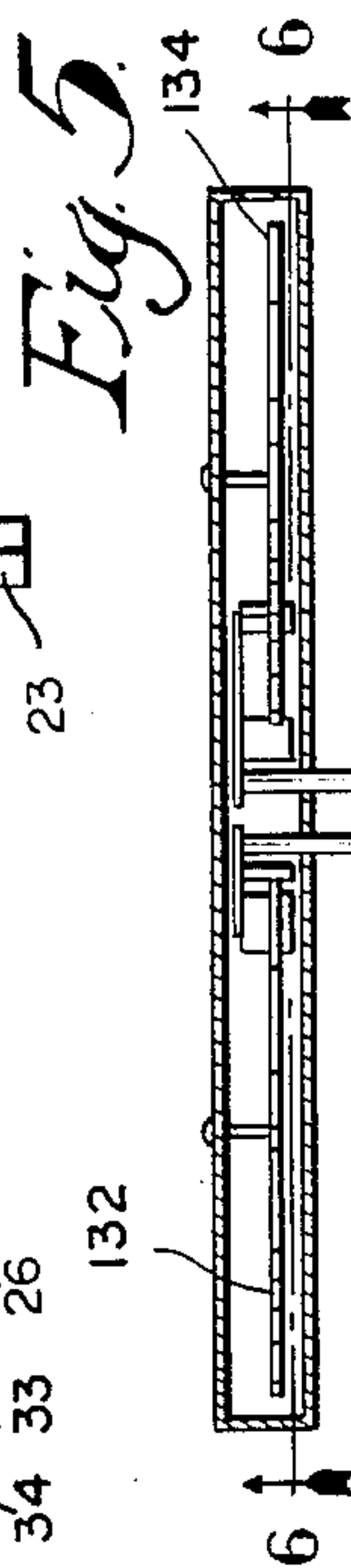
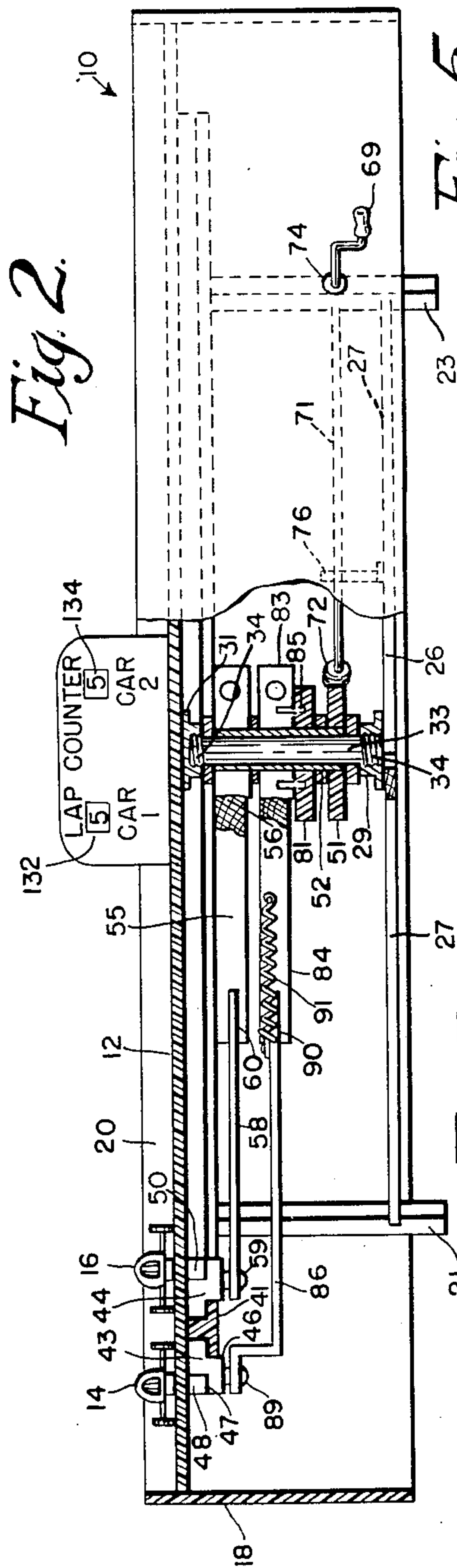
R. L. ROBINS

2,548,495

MAGNETIC RACING GAME DEVICE

Filed July 9, 1947

2 Sheets-Sheet 2



INVENTOR.  
*Russell L. Robins*  
 BY *Henry Ruhl*  
 Attorney



## UNITED STATES PATENT OFFICE

2,548,495

## MAGNETIC RACING GAME DEVICE

Russell L. Robins, Brooklyn, N. Y.

Application July 9, 1947, Serial No. 759,824

3 Claims. (Cl. 273—86)

1

The present invention relates to amusement devices, such, for example, as games, toys and simulated sporting equipment. More particularly, the invention provides a game or toy in the nature of a miniature or simulated vehicle or animal race having novel contest and other features.

Games and toys of the prior art which simulate an animal or vehicle race lack all or nearly all of the features of an actual race contest. Chance is the principal determinant of the outcome of the race, rather than skill developed as a result of practice by the participant. In these prior art games and toys, the element of chance is introduced by spinning counters, throwing dice, or by mechanisms depending on the action of rebound springs at the end of the race course, the retarding effect of friction on the objects, such as simulated vehicles engaged in the race, and other devices not in any way resembling the hazards of a real race.

In accordance with the present invention, a course is traversed by miniature vehicles, or the like. Each vehicle engaged in the contest operates over its own path defined by the design of the propulsion mechanism within the scope of the invention. The propulsion mechanism for each vehicle preferably causes it to traverse a path including a curved portion or portions. Each curved portion of the vehicle path constitutes a hazard. Other hazards are provided by attempts of a contestant to propel his vehicle at excessive speed or by failing to maintain a reasonable steady pace.

The major object of the invention, therefore, is to provide realistic sporting features, based on a player's skill, in a racing game or toy.

Another object is to provide game apparatus in which a simulated vehicle or animal is propelled by concealed means of novel structure.

A further object is to provide a novel game apparatus simulating a race track or race course having substantially parallel racing paths.

A still further object is to provide hazards of play in a novel manner for a racing game or toy.

Still another object is to provide novel magnetic propulsion means for a miniature vehicle.

In addition to the foregoing objects of the invention, other and, perhaps, more specific objects will become apparent or suggest themselves to those skilled in the art to which the invention is directed when the following specification is read in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective view of a racing game

2

embodying the invention, certain of the parts thereof being omitted for the sake of convenience of illustration;

Fig. 2 is a vertical sectional view of the game of Fig. 1 with certain of parts in a different position and with vehicles embodying the invention in suitable form, the section being taken on line 2—2 of Figs. 1 and 3;

Fig. 3 is a fragmentary view in plan with parts in the position of Fig. 2;

Fig. 4 is a fragmentary view in section on line 4—4 of Fig. 3;

Fig. 5 is a sectional view taken in plan on line 5—5 of Fig. 6 to show details of the lap counting mechanism appearing in Fig. 7;

Fig. 6 is a vertical section on line 6—6 of Fig. 5; and

Fig. 7 is a partial top plan view with parts removed of a portion of Fig. 1 to an enlarged scale showing the connection between certain parts of the mechanism appearing therein.

The invention will now be described in detail with continued reference to the illustrative embodiment shown in the drawings. Reference character 10 indicates the toy or miniature auto race, which is constructed in accordance with the invention. It is seen to comprise a table-like member 12 providing a surface upon which the miniature vehicles 14 and 16 may operate. The member 12 may be made of any suitable non-magnetic material such as wood, a laminated material, or a plastic. As shown, illustratively, it covers the entire car propelling mechanism, but it may, if desired, have a total exposed area only large enough to provide trackways for the total number of vehicles employed. It will be understood in this connection that the device 10 may be constructed as a simple toy for the small child having only one vehicle, toy animal or the like which moves in a closed regular or irregular path on the surface of the member 12, or its equivalent.

An enclosing wall member 18 surrounds the periphery of the member 12 and extends above its surface as indicated at 20 to provide a guard rail around the miniature race track provided by the surface of the member 12. The wall member 18 may be of any suitable material such as sheet metal or a plastic material. The lower part of the member 18 serves to conceal the propelling mechanism and thereby enhances the illusion of a race track.

Supporting legs 21 to 24 (three of which are unconcealed in Fig. 1) serve to support the entire device 10 and also provide end connections for



the intersecting frame members 26 and 27. As shown, these frame members may be mortised or notched at the place of intersection so that they lie in the same plane. It will be understood, of course, that they may lie one on top of the other at the center of the device, or each member may be in two pieces ending at a centrally located post-supporting bracket 29 (Fig. 2) to which they are secured. A second bracket 31 is secured to the underside of the member 12. A bearing post 33 is secured in any suitable manner, as by screw threaded connections 34, in the brackets 29 and 31.

The framework just described for supporting the bearing post 33 including the legs 21 to 24 is substantially independent of the wall member 18. However, it will be understood that the frame members 26 and 27 or their equivalent in the structure may be carried from their outer ends solely by the wall member 18.

The mechanism for guiding and propelling the visible moving part or parts of the game, such for example as the cars 14 and 16, will now be described. Beneath the table member 12 there is secured a continuous rail member 41 which is substantially T-shaped in cross-section as best shown by Figs. 1 and 2 of the drawings. The rail member 41 is secured to the under side of the member 12 in any suitable manner, but preferably by means which are invisible on the top running surface of the member 12. Counter-sunk screws, for example, with their heads concealed by plastic, may be employed for the purpose. The T-shaped section of the rail member 41 provides two continuously opposed recesses. A pair of shoes 43 and 44 slidably engage with opposite sides of the rail 41 and are guided thereby as they are moved by means later to be described. The shoe 43 is generally rectangular in cross-sectional outline and is recessed at 46 and 47. The recess 46 fits over the projecting flange of the track member 41. The recess 47 receives a permanent bar magnet 48. Salient polar projections 49 are preferably provided. The shoe 44 is of similar construction, but it is reversed when it is placed in position against the opposite flange of the rail 41. A bar magnet 50 is seated in its corresponding recess of the shoe 44.

The mechanism for driving the shoe 44 will now be described. A gear 51 is secured on a sleeve 52 which is rotatably received in nesting relationship on the bearing post 33. An arm 55 is provided with a slotted end 56 which is suitably secured upon the sleeve 52. The slotted end provides for adjustment of the effective length of the arm 55. From the parts of the propelling mechanism for the car 16 thus far described, it will be seen that as the gear 51 is rotated, the sleeve 52 and end of the arm 55 also will be rotated. An arm 58 is swingably pivoted at or adjacent the end of the arm 55 and its free end is pivoted to the shoe 44 by a pin or rivet 59, or its equivalent. The pivotal connection of the arm 58 with the arm 55 is provided by bifurcating or slitting the end of the arm 55 as indicated at 60. A pin, bolt or other bearing member 61 provides the hinge for the pivotal connection between the arms 55 and 58. An extensible spring 63 is connected between the end of the extension 66 of the arm 58 and a point on the arm 55. The spring 63 maintains the shoe 44 in sliding engagement with the track member 41 as the gear 51 is rotated. With the arrangement just described, while an oval track having two curved sections

and two straight sections is shown by way of example, it will be understood that other irregularities, in addition to the two curved sections, may be introduced into the course of the track member 41. The arrangement just described will maintain the shoe 44 in continuous engagement with the track member 41.

Rotary movement is imparted to the gear 51 from a crank handle 69 which is exposed outside of the member 18. This crank handle is connected to a shaft 71 and is provided with a worm 72, serving as a pinion, which is in mesh with the worm gear 51. The shaft 71 is journaled in a bearing 74 in the member 18 and another bearing block or member 76 which is secured to the braces 26 and 27.

The shoe 43 is driven from a second worm gear 81 which is rotatably journaled in nested relationship on the sleeve 52. The enlarged slotted end 83 of a radially extending arm 84 is also rotatably journaled on the sleeve 52. The gear 81 and the end 83 of the arm are secured together by pins 85 so that the gear 81 will cause the arm 84 to swing about the sleeve 52 as it is turned. An arm 86 is pivotally connected to the arm 84 as by a pin 88, and its free end is pivotally connected to the shoe 43 by a pin 89, for example; the end of the arm 84 is also bifurcated as indicated at 90. A tensile spring 91 is connected at a point on the arm 86 between the shoe 43 and the pivot 88. The other end of the spring is connected to the arm 84. The tension of the spring 91 holds the shoe 43 in engagement with the track 41.

A crank handle 96 at the end of a shaft 98 is exposed outside of the member 18 for imparting movement to the shoe 43. The shaft 98 is provided with a worm 101 which is in mesh with the worm wheel or gear 81. Suitable bearings, for example a bearing 102 in the member 18 and a bearing 103 secured to the cross pieces 26 and 27 maintain alignment of the shaft 98.

While a worm drive has been shown for the arms 55 and 84, it will be understood that spur or helical gearing may be employed to connect suitably exposed cranks, for example the cranks 69 and 96 to their respective arms.

In accordance with the invention, magnetic coupling is provided between each shoe and the corresponding exposed vehicle to be moved thereby. In the preferred arrangement shown in Figs. 2, 3 and 4 of the drawings full advantage is taken of the extremely powerful small sized permanent magnets which are now available. Considering the shoe 43 and the corresponding outside car 14, the previously mentioned bar magnet 48 provides a flux path for the magnet or magnets carried by the car. Each car comprises a body formed of any suitable material, and in the illustrative arrangement this car is shown as simulating a racing vehicle such as a racing automobile. Four wheels 106 are shown for supporting each car. The magnet structure for the car 14 comprises a bar 108 of magnetic material such as iron, steel or other ferrous metal to which are secured small powerful permanent magnets 109 and 111. These magnets are preferably made of one of the newer permanent magnet alloys containing nickel.

A similar arrangement is illustrated for the inside car 16 comprising a bar 114 and magnets 116 and 118. These magnets are poled so that the magnet 109 presents a N (north) pole to the bar magnet 48 and the magnet 111 presents a S (south) pole to the bar magnet. The end 119 of



5

the magnet 48 presents a S pole to the car. The polarity of the magnetic structure on the inside car 19 is reversed from this so that each car will be mountable only over its corresponding shoe. In the illustrative example the magnet 116 presents a S pole to the bar magnet 50, and the magnet 113 presents a N pole to the bar magnet 50. The polarity of the bar magnet 50 is also reversed. In operation of the embodiment of the invention just described the two cars are placed so that the flux path for each, established through the magnetic member of the corresponding shoe, drives and holds the car in position. In the illustrative arrangement two contestants may play the race game, one turning the crank handle 69 and the other turning the crank handle 96. Several hazards are present in the play. For example, if either handle is turned too rapidly the magnetic attraction between the magnetic member on the shoe and the corresponding car will be broken. It will then be necessary to back up the shoe with the consequent loss of time in an effort to establish magnetic connection with the car. A loss of game points may be assigned to this fault in the play. Another hazard of the play is the negotiation of the turns. Entering as well as leaving a turn both constitute a hazard. The drive mechanism provides for an increase of speed when entering a straightaway portion of the course. It will be understood that variations in the direction of the course may be introduced in the manufacture of the game apparatus of the invention.

A lap counting mechanism 131 is shown, illustratively, for counting the laps around the course for each car; a register 132 counts the laps of the car 14 and a register 134 counts the laps of the car 16. These registers are operated by mechanical means in the illustrative arrangement, but it will be understood that magnetic means may be employed for the purpose. The mechanical means of the illustrative embodiment comprise rotatable rods 136 and 137 for the registers 132 and 134, respectively. Treadles 139 and 141 for each rod project above the surface of the car supporting member 12. The passage of a car depresses its corresponding treadle.

Each register is in the form of a register wheel 145 having indicia in the form of successive digits 146. Each wheel 145 is provided with escapement teeth 148 having a cam slope 149 and an abrupt end 151. The rod 136 carries an escapement operating device in the form of two arms 153 and 154. These arms carry pallets 156 and 157, respectively. Rocking of the shaft causes the corresponding wheel to be advance one digit for each oscillation of the shaft 136. The rod 137 carries the arms 161 and 162 which are reversed in position with respect to the position of the arms associated with the rod 136. The pallets 156 and 157 are also reversed.

While a well known type of escapement counter is shown by way of example for counting the laps executed by each car, it will be understood that other types of counters may be used. For example, a ratchet counter may be used. Mechanical devices for operating the counters upon passage of a car are preferred as they are responsive only to the passage of the respective car.

The invention claimed is:

1. Amusement apparatus comprising a table-like member, a track secured beneath said table-

6

like member, shoes movable along said track, means for propelling each shoe comprising a pair of jointed arms, one pair for each shoe, means including a tension spring for each pair of arms for maintaining its respective shoe in position on said track, gear means for rotating said pair of arms for each shoe, and externally exposed manually operable means for imparting rotation to said gear means.

2. Amusement apparatus comprising a table-like member, a track secured beneath said table-like member, a shoe movable along said track, means for propelling said shoe comprising a pair of jointed arms, means including a tension spring for the pair of arms for maintaining the shoe in position on said track, gear means for rotating said pair of arms and externally exposed manually operable means for imparting rotation to said gear means.

3. Apparatus for the display of skill comprising a table-like member, a pair of vehicles movable over said table-like member, means to impart movement to said vehicles comprising a pair of shoe members, one for each vehicle, a track member having the path of a closed curve beneath said table-like member for guiding said shoe members, means for providing magnetic coupling between each shoe member and its respective vehicle, a bearing post located within the confines of said track member, a sleeve member journaled on said bearing post, a gear secured to said sleeve member adjacent one end thereof, an arm member secured to said sleeve member adjacent to the other end thereof, a lever member connecting one of said shoe members to said arm, a second gear member journaled on said sleeve, a second arm member secured to said second gear member, a second lever pivotally connected to said second arm and to said other shoe member, a shaft provided with a pinion, said pinion being in mesh with said first named gear, a second shaft provided with a pinion, said second pinion being in mesh with said second gear, and a crank on the end of each shaft, said cranks being exposed beyond the limits of said table member.

RUSSELL L. ROBINS.

#### REFERENCES CITED

The following references are of record in the file of this patent:

#### UNITED STATES PATENTS

Number	Name	Date
259,327	Maxfield	June 13, 1882
339,443	Marean	Apr. 6, 1886
588,988	Harrington	Aug. 31, 1897
1,171,972	Myers	Feb. 15, 1916
1,497,382	Rollason	June 10, 1924
1,533,540	Craigen	Apr. 14, 1925
1,553,895	Garcia	Sept. 15, 1925
1,702,291	Babbitt	Feb. 19, 1929
2,103,447	Carl	Dec. 28, 1937
2,133,194	Horn	Oct. 11, 1938
2,188,619	Bernhardt	Jan. 30, 1940
2,239,395	Mallory	Apr. 22, 1941
2,254,967	Larkins	Sept. 2, 1941

#### FOREIGN PATENTS

Number	Country	Date
650,499	France	Sept. 24, 1928