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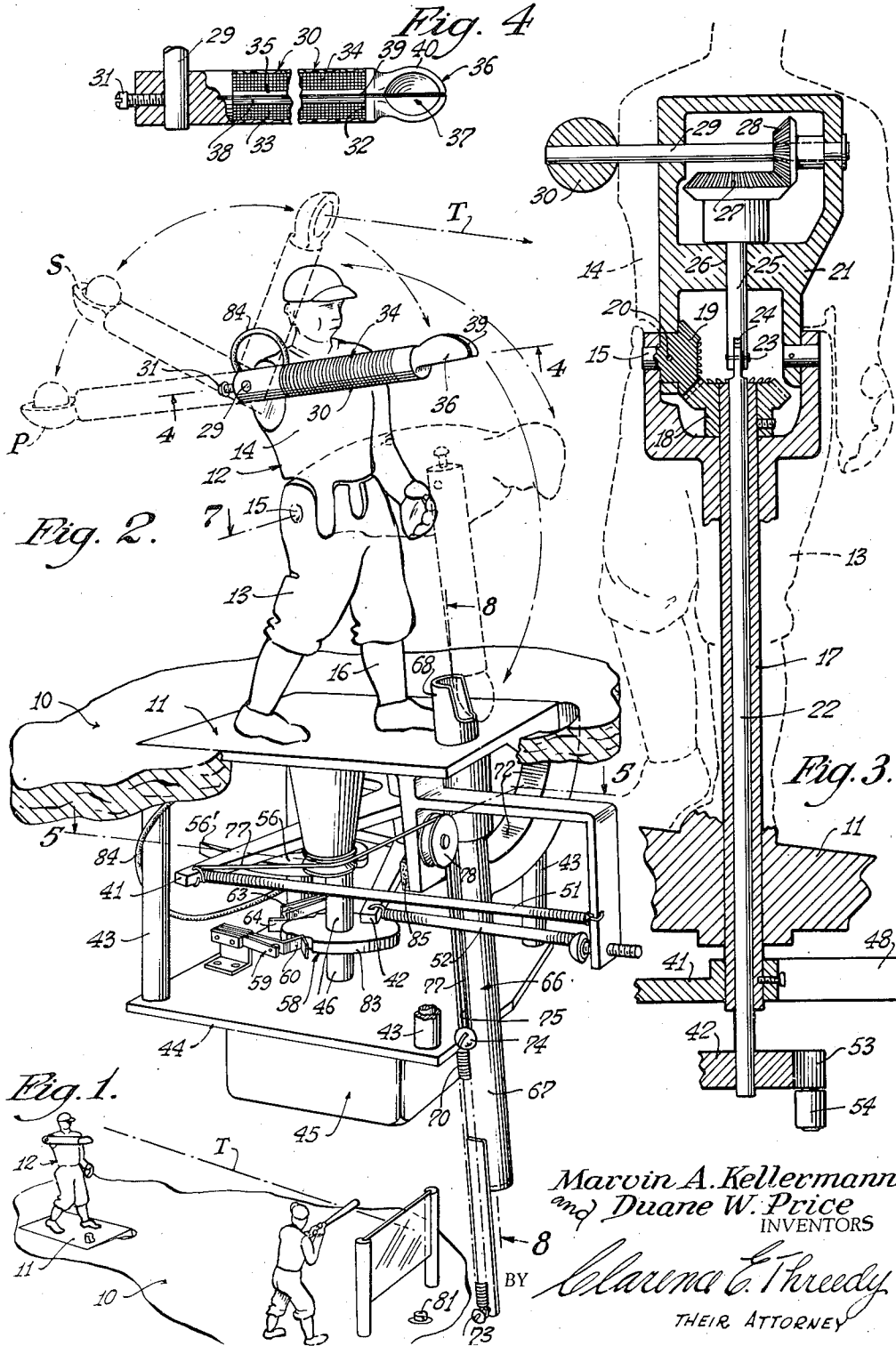
M. A. KELLERMANN ET AL

2,294,035

BALL PITCHER

Filed Oct. 8, 1941

2 Sheets-Sheet 1



Marvin A. Kellermann
and Duane W. Price
INVENTORS

BY *Clarence E. Threedy*
THEIR ATTORNEY

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2 Sheets-Sheet 2

Fig. 5.

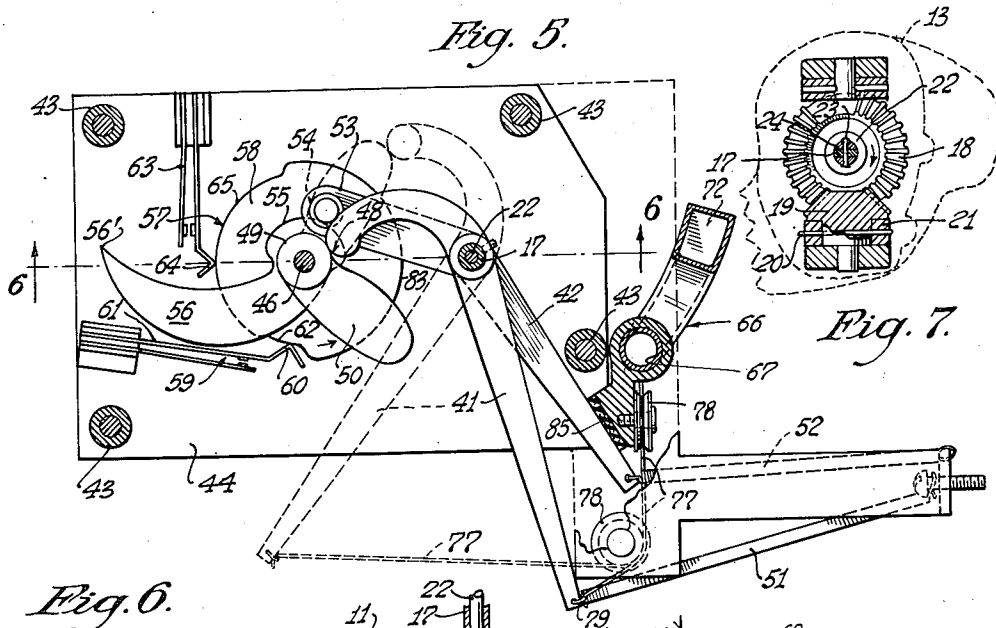


Fig. 7.

Fig. 6.

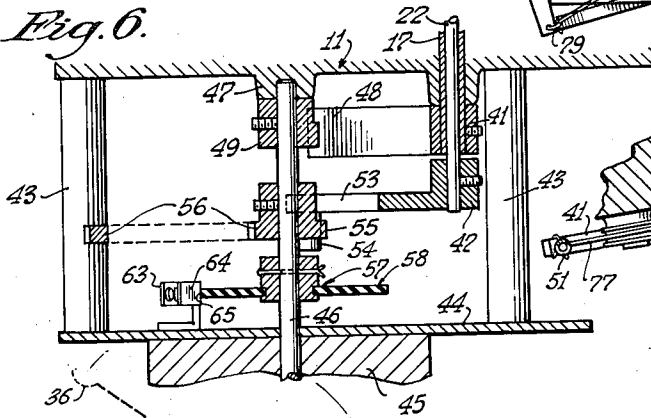


Fig. 8.

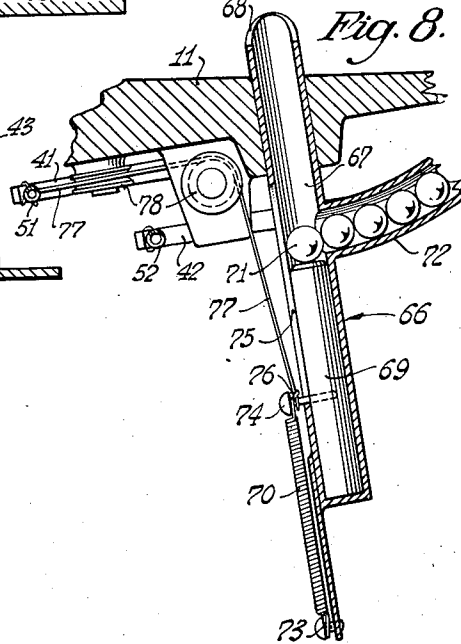
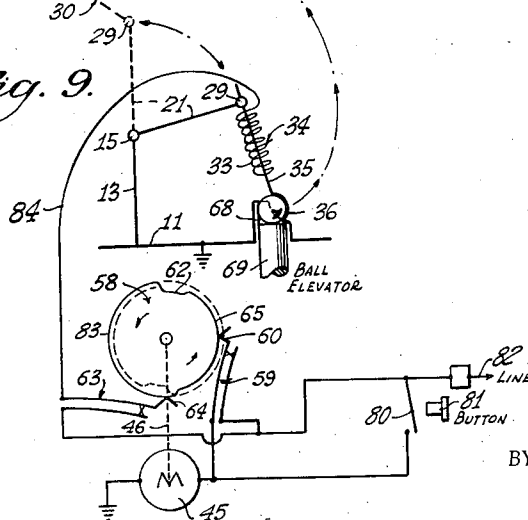


Fig. 9.



Marvin A. Kellermann
and Duane W. Price
INVENTORS

BY Clarence E. Freedy
THEIR ATTORNEY

UNITED STATES PATENT OFFICE

2,294,035

BALL PITCHER

Marvin A. Kellermann and Duane W. Price,
Chicago, Ill.

Application October 8, 1941, Serial No. 414,116

19 Claims. (Cl. 124—7)

This invention relates to a game apparatus, and more particularly to a ball projecting mechanism to be employed in game apparatuses.

It is an object of this invention to provide an automatic ball pitching mechanism adapted to receive a ball from a supply source and to project the ball through a predetermined trajectory.

Another object of this invention is to provide in a ball projecting mechanism having an arm adapted to pitch a ball through a given path, a means for attracting and holding the ball in the hand portion of the arm until the actual pitching movement takes place.

A further object of this invention is to provide in a ball projecting unit a novel manikin structure adapted to move into a ball receiving position and to return to normal position preparatory to pitching operation.

A still further object of this invention is to provide in a ball projecting unit a novel means for conveying balls from a supply source to a ball pitching arm simultaneously with the movement of the arm into ball receiving position.

Other objects will appear more fully hereinafter.

The invention consists in the novel combination and arrangement of parts hereinafter described and claimed.

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

Fig. 1 is a fragmentary perspective view illustrating the ball projecting manikin in its relative position on a playboard;

Fig. 2 is a fragmentary perspective view of the ball projecting unit of our invention;

Fig. 3 is a vertical sectional detail view through the super-structure for the manikin illustrated in Fig. 2;

Fig. 4 is a sectional detail view through the ball pitching arm of the manikin and is taken substantially along line 4—4 in Fig. 2;

Fig. 5 is a horizontal detail plan view, partly in section, of the super-structure of our ball projecting unit as seen from line 5—5 in Fig. 2;

Fig. 6 is a vertical sectional detail view of the super-structure seen in Fig. 5 and is taken substantially along line 6—6 thereof;

Fig. 7 is a horizontal sectional detail taken on the hip line of the manikin substantially along line 7 in Fig. 2;

Fig. 8 is a vertical sectional detail view through the ball elevating mechanism formed on a part of our unit as seen along line 8—8 in Fig. 2; and

Fig. 9 is an electrical diagram of the circuit employed in our unit and showing, diagrammati-

cally, the unit in the course of movement of its intended operation.

Various types of ball pitching means have heretofore been employed in amusement devices simulating a baseball game.

We are, therefore, aware of the fact that ball projectors as such are not new. However, our invention contemplates an automatic pitching device which will operate through a cycle of movements to simulate the grasping of a ball in the pitching hand and the actual swing of the pitching arm to propel the ball along a predetermined path of movement.

A device capable of performing the foregoing operation, so closely mimicking the movements of an actual baseball pitcher, gives the player of such game an opportunity to time the structure of a manually controlled batting instrument employed in the game.

The new unit is preferably mounted upon a ball playing surface 10 with a base portion 11 constituting the "pitcher's box" flush with the top surface of the board 10. A manikin 12 is positioned on the base 11 and has its lower portion or standard 13, from the hips down, formed integrally with the base 11. The upper portion 14 of the body is pivotally arranged as at 15 on the portion 13 for rotative movement about the horizontal axis 15. Suitably mounted for rotative movement within one leg 16 of the lower portion 13 is a pair of driving shafts for the manikin. One of the shafts 17 is of a sleeve form and has at its upper end a bevelled gear 18 meshing with a gear 19 which is pinned as at 20 to the frame 21 of the upper portion 14 forming the trunk of the manikin. The bevelled gear 19 is concentric with the horizontal axis 15 forming the hip line of the manikin and serves when the sleeve 17 is rotated, as hereinafter to be explained, to rotate the upper portion 14 of the body into the dotted line position, Fig. 2. The other vertically disposed shaft 22 is mounted for rotative movement within the sleeve 17 and has its upper end pivotally connected as at 23 in a yoke formation 24 on an auxiliary shaft 25 adapted to rotate with the shaft 22 by means hereinafter to be explained. The pivotal connection 23 being coaxial with the axis 15 to permit the rotative movement of the body as aforesaid. The auxiliary shaft 25 is journaled as at 26 in the frame 21 and has a bevelled gear 27 at its upper end engageable with a bevelled gear 28 fixedly attached to a horizontally arranged shaft or pin 29 at the shoulder line of the manikin 12.

A novel pitching arm 30 is employed in the

present unit and is adapted to be fixedly attached by a set screw 31 to the outer or free end of the shoulder pin 29 for rotation therewith. The arm 30 has a portion of its body cut away to provide a spool formation 32 about which electric wire 33 is wound to provide an electro-magnetic coil 34 for the arm 30. The portion 35 of the arm about which the wiring 33 is coiled comprises a core for the electro-magnetic means and has extending therefrom a hand portion 36 which is recessed as at 37 to provide a seat formation for a ball to be projected by the pitcher. The entire core 35 and hand 36 is split by means of a saw kerf 38 and disposed in the space provided by the saw kerf is a fibre insulating material 39. The advantage of this non-conductive spacer element is found in the fact that the magnetism set up in the hand will bridge the rim portions 40 transversely of the hand thereby assuring a positive seating of a magnetically attractable ball in the recess 37.

The lower ends of the shafts 17-22 extend beneath the base 11 such that a cam lever 41 may be arranged at the lower end of the sleeve 17 for movement therewith, the shaft 22 extending beyond the lower end of the sleeve 17 to allow the mounting of a lever 42 thereon.

There is suspended from the base 11 by means of spacer bolts 43, a motor mounting plate 44 which carries on its under side a motor 45, the drive shaft 46 of which extends above the mounting plate 44 into a boss formation 47 formed in the under side of the base 11. The shaft 46 of the motor 45 is adapted to rotate at a relatively slow speed by reason of a reduction gear unit (not shown) forming a part of the motor 45. Each of the levers 41 and 42 is normally urged into the position shown in Fig. 5 by spring means 51-52 respectively. The lever 41 having a cam extension 48 adapted to bear against the hub 49 of a cam 50 hereinafter referred to as the "body cam." The cam lever 42 has an extending arm 53 carrying a roller 54, which roller 54 normally engages the lower formation 55 of a cam 56, hereinafter referred to as the "arm cam."

A main control device is indicated at 57 and constitutes a camming disc 58 fixed to the motor shaft 46 for rotation therewith and having a peripheral edge recessed at certain intervals for the purpose of controlling the cycle of operation of the motor. The main control also consists of a pair of switches operatively arranged with respect to the camming disc 58. A motor switch indicated at 59 has an end portion 60 of one contact arm 61 engaging the peripheral edge of the camming disc 58 and this switch 59 is normally disposed as shown in Fig. 5 with the cam portion 60 thereof seated in a stop recess 62 formed on the camming disc so that the contact arms of the switch 59 are in broken circuit condition. The other switch element 63 employed in the control means has a cam formation 64 which engages the peripheral edge of the camming disc 58 and normally rests as seen in Fig. 5 on a secondary level 65 so that the switch 63 will assume broken circuit condition.

There is provided in the present unit a ball elevating device 66 and this elevating device comprises a tube formation 67, the upper end of which extends through the base 11 to provide a supply pocket 68 on the top surface of the base 11 adjacent the standard 13. A plunger 69 is disposed within the tube 67 and is normally urged into the lowermost area of the tube by spring

means 70 so that the upper end of the plunger 69 is normally disposed to receive a ball 71 from a gravity feed chute 72 extending from the upper surface of the play field or from any other ball retaining means as desired. The spring means 70 is anchored on the elevating device as at 73 and has its opposite end attached to pin means 74 extending from the elevator plunger 69. This pin means 74 is adapted to move in a slot formation 75 formed in one wall of the tube 67 and has attached thereto one end 76 of a cable 77 trained over suitable pulley means 78 and having its opposite end attached to the free end 79 of the cam lever 41 which is associated with the body moving sleeve 17.

Having thus described the construction of our new ball projecting unit, reference is now made to Figs. 1 and 9 for the purpose of describing the operation of the same.

When a player approaches the game, the manikin is normally positioned as shown in Figs. 1 and 2 with the pitching arm 30 in ball pitched position, as shown in full lines. A suitable starting switch is provided to initially energize the motor, such starting switch is indicated at 80 and is normally accessible to the player whereby he need merely press a button 81 to direct current from the main line 82 into the motor 45. Such initial operation of the motor will rotate the drive shaft 46 counter-clockwise (Figs. 2 and 5) whereupon the recessed formation 62 on the camming disc 58 will ride out from under the cammed end 60 of the switch 59 to dispose the latter in circuit making condition as seen in Fig. 9. The switch 59 then completes circuit from the line 82 to the motor 45 so that the motor will continue to operate without further use of the push button switch 80. Within a short secondary movement thereafter the switch 63 will be caused to ride on the high level 65 of the camming disc 58 to dispose the switch 63 in closed circuit condition. The switch 63 is connected in circuit with the electro-magnet 34 in the arm 30 through a flexible cable 84 through which the electromagnet 34 will become energized during the initial rotation of the drive shaft 46.

As seen in Fig. 5, within the first quarter rotation of the shaft 46, the body cam 50 will urge the cam lever 41 into the dotted line position and such movement will be imparted to the sleeve 17 to rotate the latter clockwise (Fig. 7) to impart a like rotative movement to the bevelled gear 18 whereupon the upper frame 21 and body 14 thereto attached will swing into the dotted line position (Fig. 2) to dispose the already magnetized hand 36 over the delivery opening 68 of the ball elevating means 66. Simultaneous with the rotative movement of the body 14 through the movement of the cam lever 41, the cable 77 attached to the lever 41 will be drawn over the pulley arrangement 78 to lift the plunger 69 against the action of spring 70 thereby positioning the ball 71 at the delivery opening 68 at the moment the hand reaches that position as aforesaid. By reason of the magnetic characteristic of the hand, the ball will be attracted into the seat formation 37 and will be retained thereby through the magnetic field created therein as the body returns to an erect position by reason of the body cam continuing its rotative movement and permitting the lever 41 to return by its spring 51 to normal position.

Just prior to the upper body portion returning to fully erect position, the arm cam 56 will have

commenced to bear against the roller 54 on the cam lever 42 to rock the latter clockwise thereby rotating the shaft 22—25 and through the bevelled gears 27—28 rotate the shoulder pin 29 counterclockwise (Fig. 2), the hand and the arm 30 swinging backward toward ball pitching position just as though the manikin were winding up for the pitch. As the arm in its movement toward pitching position reaches the point indicated at S, the camming disc 58 will have rotated to a point where the cam 64 of the switch 63 will ride into the recessed formation 62, thus breaking the circuit through the switch 63 to de-energize the electro-magnet 64 thereby demagnetizing the hand 36, the ball thereafter resting in the cup formation by gravity.

Continued operation of the arm cam 56 causes the arm 30 to move the balance of the distance toward pitching position indicated at P (Fig. 2) in which position the roller member 54 will be about to be released by the free end portion 55' of the cam 56. As the point 56' passes from beneath the roller 54 the spring means 52 is tensioned and by reason of disengagement of the roller 54 by the cam 56 the cam arm 42 will be returned abruptly to its initial position by the spring 52, there being a suitable bumper 85 on the base 11 to lessen the shock of such abrupt return of the lever 42. The quick swinging movement of the lever 42 back toward normal position will, through the shaft 22—25—29, cause the pitching arm 30 to quickly swing back toward ball pitched position such that the centrifugal force created by such movement will cause the now free ball to be projected from the hand along a predetermined trajectory indicated at T toward the batting instrumentality or any other suitable game playing means employed therewith. Thereafter, the motor 45 will be de-energized by reason of the switch 59 again assuming its relationship with the stop recess 62 in the camming disc 58. The unit now being ready for repeated operation by manipulation of the push button 81.

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

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

1. A ball pitching device comprising a body having an arm portion movable into and out of ball pitching position, means for magnetizing said arm whereby a portion thereof will attract and hold a magnetic ball during movement of the arm into pitching position, means for demagnetizing said arm at a point adjacent the limit of its movement into said pitching position, means for moving the arm into said pitching position and for releasing said arm for movement in an opposite direction toward pitched position, and spring means for moving said arm in said opposite direction upon release of said arm by said arm moving means.

2. A ball pitching device comprising a body having an arm portion movable into and out of ball pitching position, means for magnetizing said arm whereby a portion thereof will attract and hold a magnetic ball during movement of

the arm into pitching position, means for demagnetizing said arm at a point adjacent the limit of its movement into said pitching position, means for moving the arm into said pitching position and for releasing said arm for movement in an opposite direction toward pitched position, and spring means for moving said arm in said opposite direction upon release of said arm by said arm moving means, that portion of said arm to which the ball is attracted being recessed to provide a seat for said ball during the aforesaid movement of said arm.

3. A ball pitching device comprising a body having an arm portion movable into and out of ball pitching position, means for magnetizing said arm whereby a portion thereof will attract and hold a magnetic ball during movement of the arm into pitching position, means for demagnetizing said arm at a point adjacent the limit of its movement into said pitching position, means for moving the arm into said pitching position and for releasing said arm for movement in an opposite direction toward pitched position, and spring means for moving said arm in said opposite direction upon release of said arm by said arm moving means, that portion of said arm to which the ball is attracted being recessed to provide a seat for said ball during the aforesaid movement of said arm, said seat serving to support said ball on said arm during its movement from pitching to substantially pitched position.

4. A ball pitching device comprising a body having an arm portion movable into and out of ball pitching position, means for magnetizing said arm whereby a portion thereof will attract and hold a magnetic ball during movement of the arm into pitching position, means for demagnetizing said arm at a point adjacent the limit of its movement into said pitching position, means for moving the arm into said pitching position and for releasing said arm for movement in an opposite direction toward pitched position, and spring means for moving said arm in said opposite direction upon release of said arm by said arm moving means, that portion of said arm to which the ball is attracted being recessed to provide a seat for said ball during the aforesaid movement of said arm, said recess serving to support said ball on said arm when said arm is demagnetized by said arm demagnetizing means.

5. In a ball pitching device comprising a body having a fixed nether portion and a movable trunk portion, an arm movably mounted on the trunk portion, and having a recessed end portion, spring means normally urging said arm into pitched position, means for moving said trunk portion into a bent position, means for magnetizing said arm during the foregoing movement whereby said recessed end portion will attract and retain a magnetic ball during movement of the arm into pitching position, means for demagnetizing said arm at a point adjacent said pitching position, means for moving the arm into said pitching position and adapted to release the latter for movement in an opposite direction by said spring means.

6. In a ball pitching device comprising a body having a fixed nether portion and a movable trunk portion, an arm movably mounted on the trunk portion, and having a recessed end portion, spring means normally urging said arm into pitched position, means for moving said trunk portion into a bent position, means for

magnetizing said arm during the foregoing movement whereby said recessed end portion will attract and retain a magnetic ball during movement of the arm into pitching position, means for demagnetizing said arm at a point adjacent said pitching position, means for moving the arm into said pitching position and adapted to release the latter for movement in an opposite direction by said spring means, ball guiding means adapted to direct a ball to said hand simultaneous with said movement of said trunk into a bent position.

7. In a ball pitching device comprising a body having a fixed nether portion and a movable trunk portion, an arm movably mounted on the trunk portion, and having a recessed end portion, spring means normally urging said arm into pitched position, means for moving said trunk portion into a bent position, means for magnetizing said arm during the foregoing movement whereby said recessed end portion will attract and retain a magnetic ball during movement of the arm into pitching position, means for demagnetizing said arm at a point adjacent said pitching position, means for moving the arm into said pitching position and adapted to release the latter for movement in an opposite direction by said spring means, and ball elevating means operatively related to said means for moving said trunk whereby to deliver a ball to said recessed end portion of said movable arm when the trunk moves to bent position as aforesaid.

8. In an amusement device, a ball projecting unit comprising a body having a fixed lower portion and a movable upper portion, means mounting said upper portion for pivotal movement about a horizontal axis, an arm mounted on said upper portion and having a recessed hand portion adapted to move through a pitching arc, spring means normally retaining said arm in pitched position, ball delivery means for delivering a magnetically attractable ball to a point adjacent said fixed lower portion, means for moving said upper portion into a bent position with the hand portion of said arm adjacent the ball delivery means, electromagnetic means in said arm, means for energizing said electromagnetic means when said body is bent as aforesaid, means for deenergizing said electromagnetic means when said arm substantially reaches pitching position, means for moving the arm into pitching position and for releasing said arm for movement back toward pitched position by said spring means.

9. In an amusement device, a ball projecting unit comprising a body having a fixed lower portion and a movable upper portion, means mounting said upper portion for pivotal movement about a horizontal axis, an arm mounted on said upper portion and having a recessed hand portion adapted to move through a pitching arc, spring means normally retaining said arm in pitched position, ball delivery means for delivering a magnetically attractable ball to a point adjacent said fixed lower portion, means for moving said upper portion into a bent position with the hand portion of said arm adjacent the ball delivery means and simultaneously effecting operation of said ball delivery means, electromagnetic means in said arm, means for energizing said electromagnetic means when said body is bent as aforesaid, means for deenergizing said electromagnetic means when said arm substantially reaches pitching position, means for mov-

ing the arm into pitching position and for releasing said arm for movement back toward pitched position by said spring means.

10. In combination with a ball pitching device comprising a manikin having a body bendable at the hips, a ball pitching arm on said body and adapted to move with the same and to move relative to said body in ball pitching fashion, magnetic means on said arm for attracting metal balls to the hand portion thereof, a ball elevating means adapted to move a ball from a lower level to a point adjacent said manikin, means operatively associated with said body and said ball elevating means whereby to simultaneously move said body and said ball to bring the hand and the ball into contact with each other.

11. In a device of the class described having a ball playing surface and a ball pitching unit mounted thereon, the combination of a movable body on said unit, means for pitching a ball on said body and movable therewith and including a magnetic hand, ball elevating means suspended from said surface and adapted to lift a magnetically attractable ball from a lower level to a point adjacent said body, and means for moving a ball to said position aforesaid, said last named means coacting with said body to move the latter into a bent position to dispose said hand into ball receiving position at said elevating means.

12. In a device of the class described having a ball playing surface and a ball pitching unit mounted thereon, the combination of a movable body on said unit, means for pitching a ball on said body and movable therewith and including a magnetic hand, ball elevating means suspended from said surface and adapted to lift a magnetically attractable ball from a lower level to a point adjacent said body, and means for moving a ball to said position aforesaid, said last named means coacting with said body to move the latter into a bent position to dispose said hand into ball receiving position at said elevating means, spring means urging said ball pitching means into pitched position and means for moving said ball pitching means against the action of said spring and to release said pitching means for movement toward pitched position by said spring whereby to release said ball from said hand.

13. In an automatic ball pitching unit comprising a manikin mounted on a board and having a body bendable at the hips, spring means normally urging the body of said manikin into an erect position, an arm mounted on said manikin for pivotal movement, spring means normally urging said arm into ball pitched condition, means for moving said arm and for bending said manikin at the hips, said means comprising a shaft having drive connection with said arm and a rotatable sleeve arranged coaxially on the shaft and having drive connection with said body, cam means on said shaft and sleeve beneath the board and adapted to rotate said shaft and sleeve in timed relation against the action of each of said spring means, motor means for driving said cam means, and manually controlled switch means for initially energizing said motor means.

14. In an automatic ball pitching unit comprising a manikin mounted on a board and having a body bendable at the hips, spring means normally urging the body of said manikin into an erect position, an arm mounted on said manikin for pivotal movement, spring means normally urging said arm into ball pitched condition,

means for moving said arm and for bending said manikin at the hips, said means comprising a shaft having drive connection with said arm and a rotatable sleeve arranged coaxially on the shaft and having drive connection with said body, cam means on said shaft and sleeve beneath the board and adapted to rotate said shaft and sleeve in timed relation against the action of each of said spring means, motor means for driving said cam means, and manually controlled switch means for initially energizing said motor means, control means for said motor arranged to permit one cycle of operation of said cam means for the purpose aforesaid upon each operation of said manually controlled switch means.

15. In an amusement device, a ball projecting unit comprising in combination, a standard arranged on a ball playing surface, a body pivotally mounted on said standard and arranged for pivotal movement about a horizontal axis, a rotatable shaft arranged in said body parallel to said horizontal axis, a magnetic arm having a recessed hand portion carried by said shaft and adapted to swing through an arc to simulate the pitching of a ball, spring means normally urging said arm to ball pitched position, means for rotating said body into a bent position with the hand portion of said arm disposed adjacent the surface of the board to receive a ball therefrom and means for moving said arm to ball pitching position against the action of said spring means and for releasing said arm for movement toward said pitched position by said spring means.

16. In an amusement device, a ball projecting unit comprising in combination, a standard arranged on a ball playing surface, a body pivotally mounted on said standard and arranged for pivotal movement about a horizontal axis, a rotatable shaft arranged in said body parallel to said horizontal axis, a magnetic arm having a recessed hand portion carried by said shaft and adapted to swing through an arc to simulate the pitching of a ball, spring means normally urging said arm to ball pitched position, means for rotating said body into a bent position with the hand portion of said arm disposed adjacent the surface of the board to receive a ball therefrom and means for moving said arm to ball pitching position against the action of said spring means and for releasing said arm for movement toward said pitched position by said spring means, means for magnetizing said arm, whereby to attract a ball to said hand portion, and means for rendering said magnetizing means inoperative as the arm reaches pitching position as aforesaid.

17. In a ball pitching device, a vertical standard, lever means arranged on said standard and adapted to swing through an arc from pitched position to pitching position, said lever having a concaved hand portion adapted to receive a ball, ball delivery means arranged to supply a magnetically attractable ball to a point adjacent said standard, means for moving said arm to dispose the hand portion thereof to said point adjacent said standard, and means for magnetizing said arm and the hand portion thereof whereby to attract and retain a ball supplied as aforesaid.

18. In a ball pitching device, a vertical standard, lever means arranged on said standard and adapted to swing through an arc from pitched position to pitching position, said lever having a concaved hand portion adapted to receive a ball, ball delivery means arranged to supply a magnetically attractable ball to a point adjacent said standard, means for moving said arm to dispose the hand portion thereof to said point adjacent said standard, means for magnetizing said arm and the hand portion thereof whereby to attract and retain a ball supplied as aforesaid, means for urging said arm into pitched position, means for moving said arm into pitching position and for releasing the same for abrupt movement back to pitched position, and means for demagnetizing said arm at pitching position.

19. In a device of the class described, a ball pitching unit comprising a manikin mounted on a play board and having a body bendable at the hips, an arm mounted on said body for pivotal movement into and out of ball pitching position, means for moving said body and said arm as aforesaid, said means comprising a shaft drivingly connected to said arm and a sleeve drivingly connected to said body, said shaft and sleeve extending through said playboard and having lever means arranged thereon beneath the board, spring means on each of said levers for urging the same into a normal position, cam means engageable with each of said levers to move the latter against the action of said spring means whereby to effect a bending of the body to position the arm thereof in ball receiving condition and to pivot said arm toward pitching position, motor means for driving said cam, control means for said motor and movable with said cam means and means for initially energizing said motor to effect operation of said control means.

MARVIN A. KELLERMANN.
DUANE W. PRICE.