

Sept. 27, 1927.

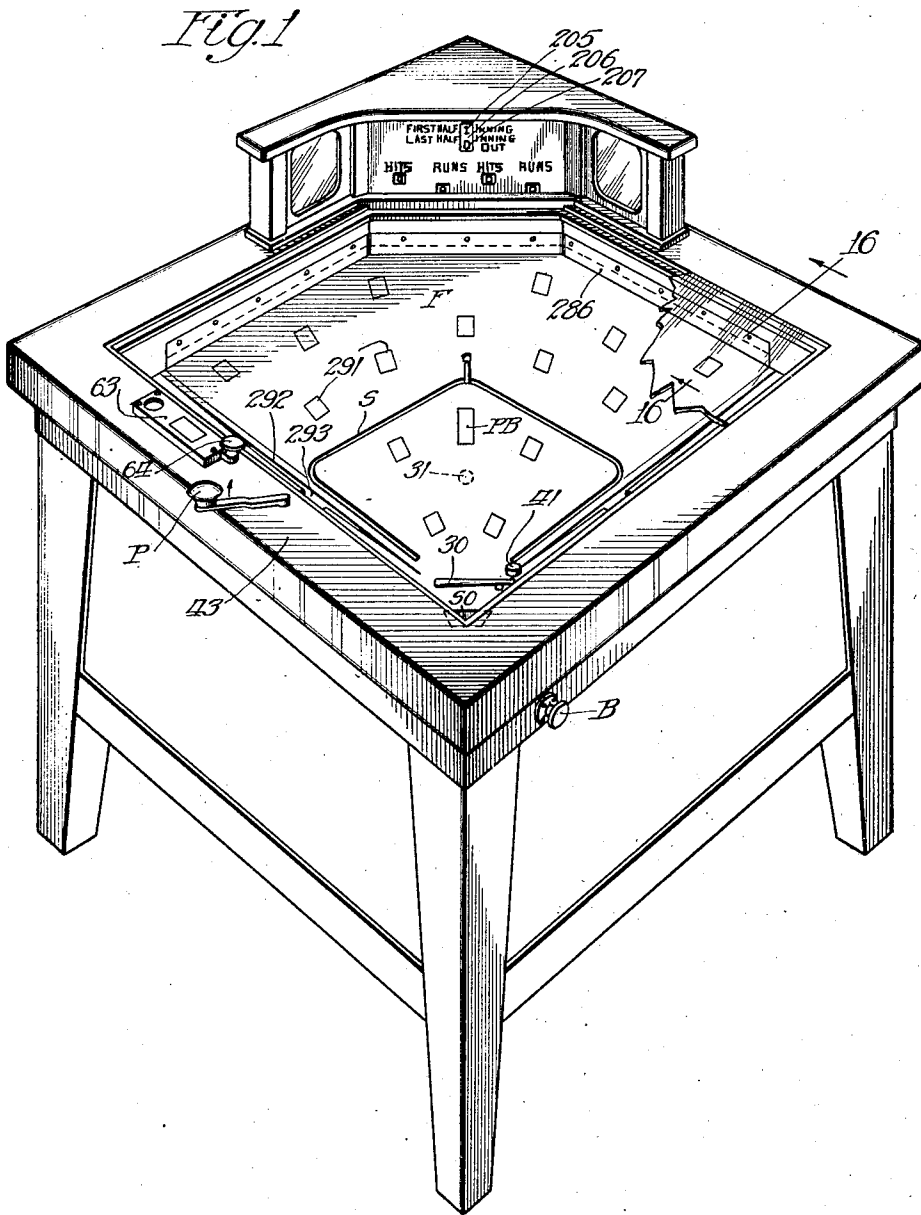
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E. B. ROPP

AUTOMATIC BASEBALL GAME

Filed June 15, 1925

16 Sheets-Sheet 1



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Sept. 27, 1927.

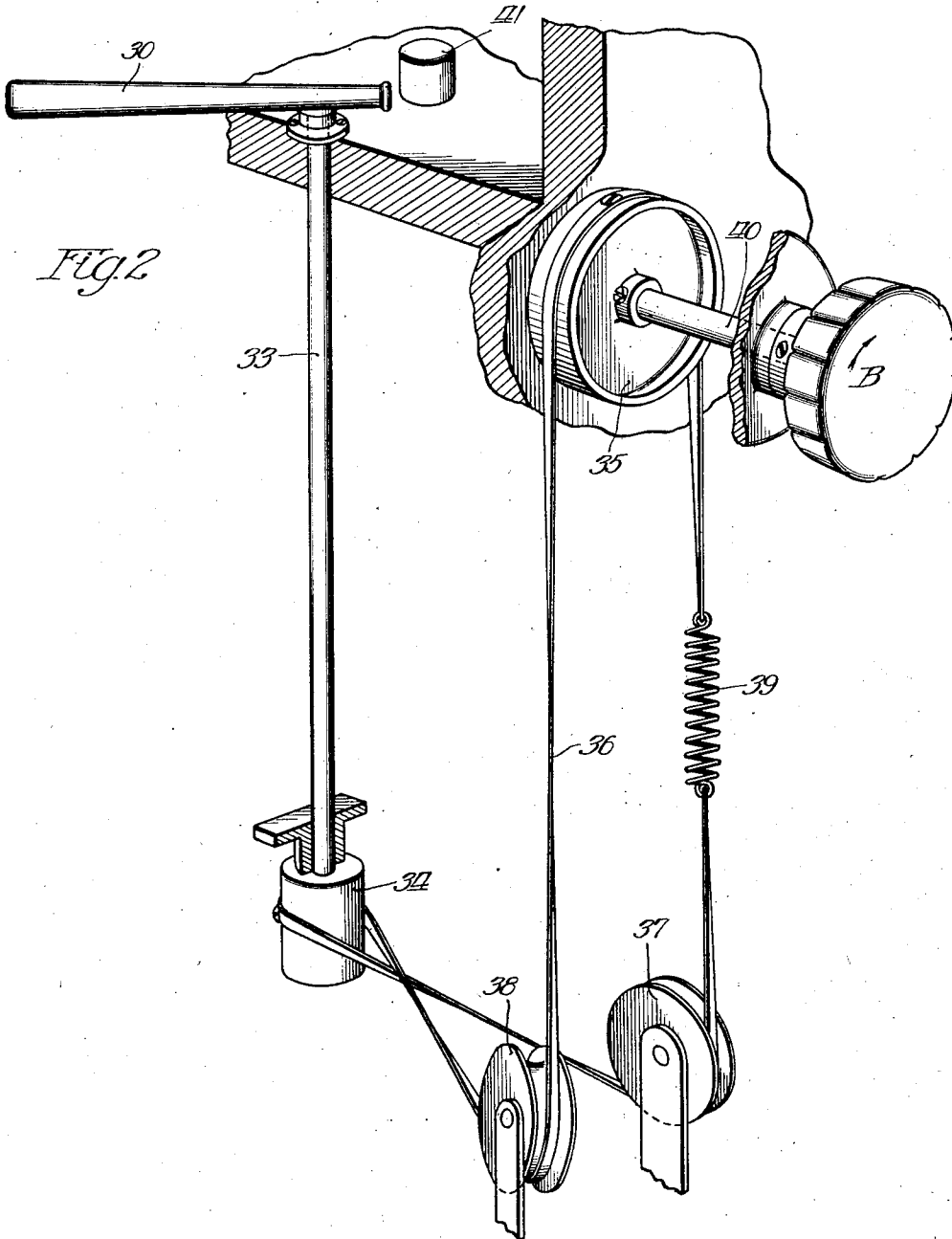
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E. B. ROPP

AUTOMATIC BASEBALL GAME

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16 Sheets-Sheet 2



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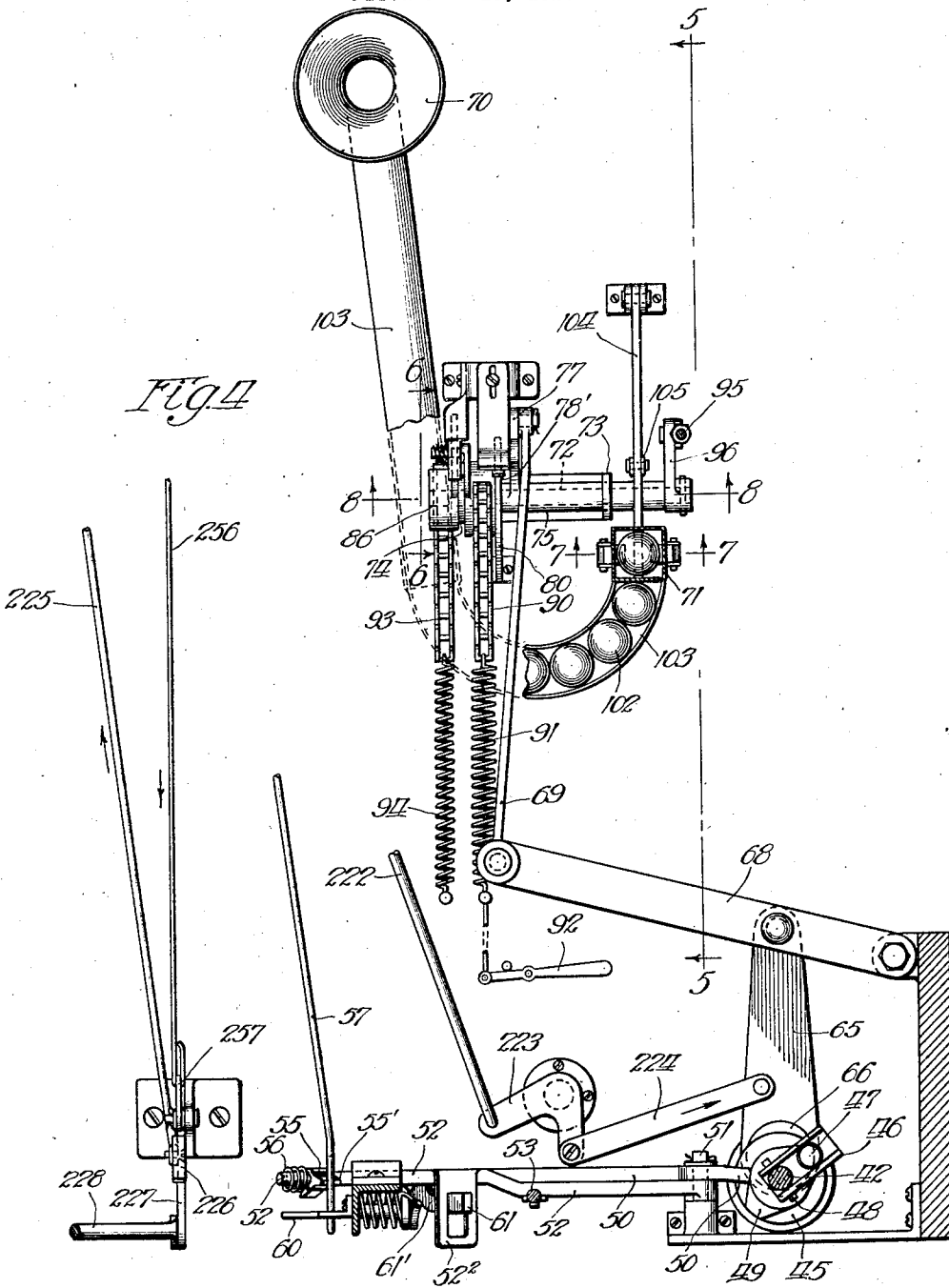
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AUTOMATIC BASEBALL GAME

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16 Sheets-Sheet 4



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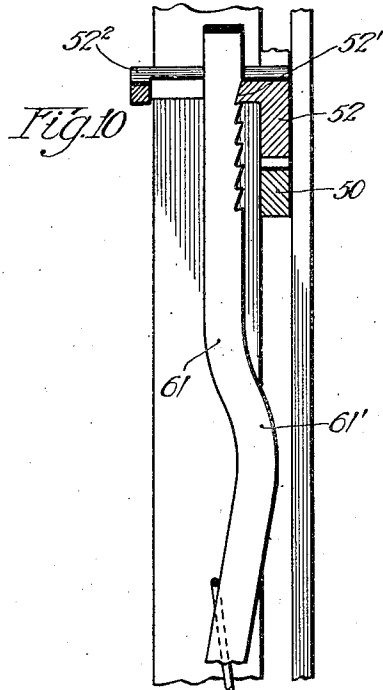
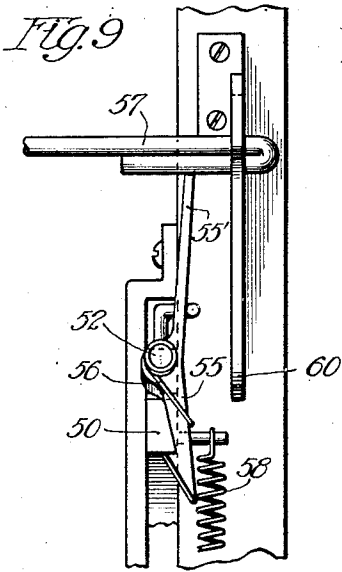
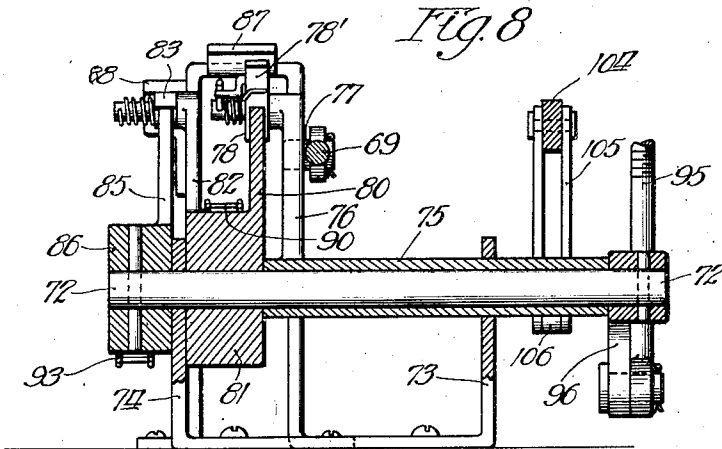
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AUTOMATIC BASEBALL GAME

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16 Sheets-Sheet 6



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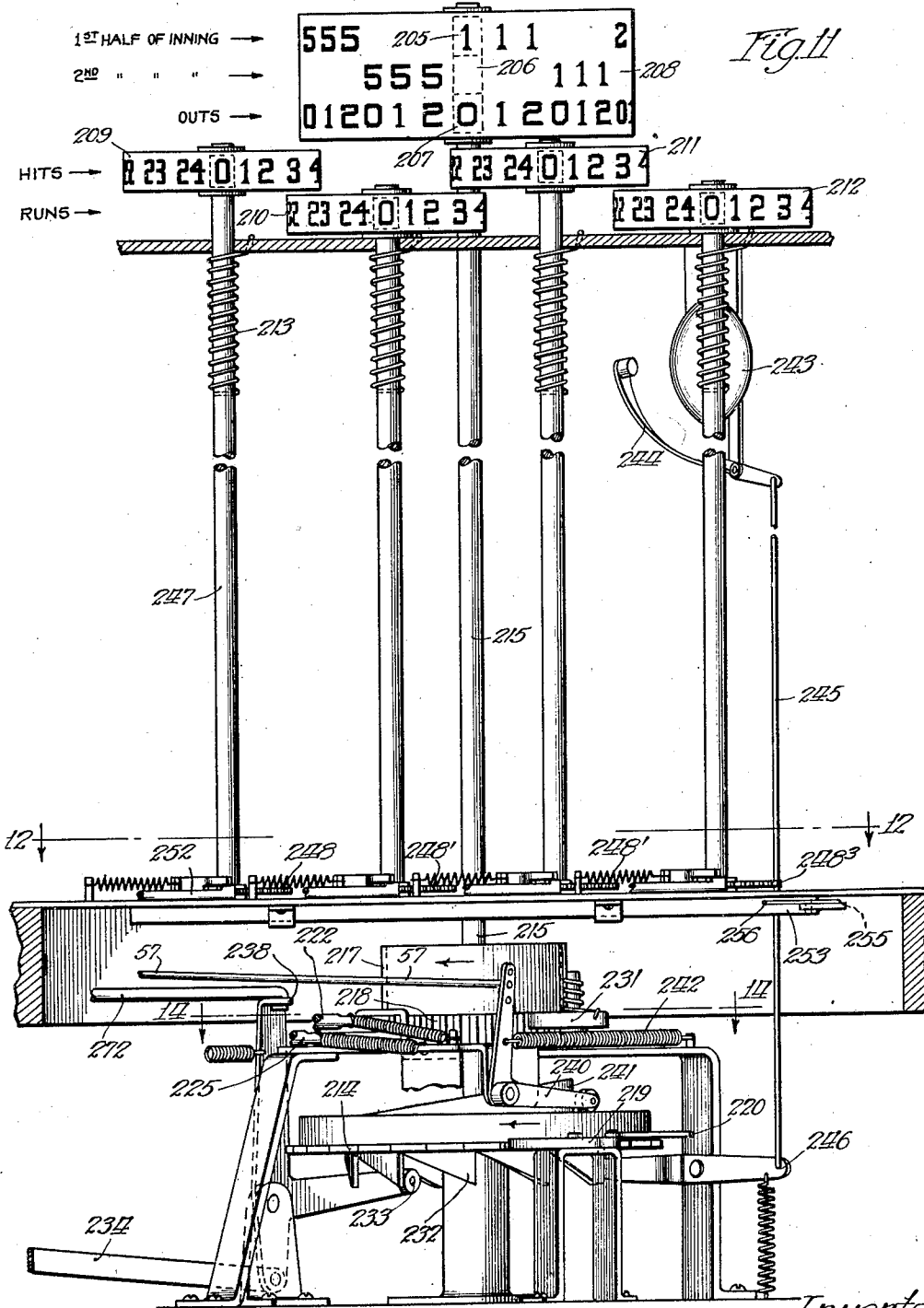
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AUTOMATIC BASEBALL GAME

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16 Sheets-Sheet 7



*Fig. 11*

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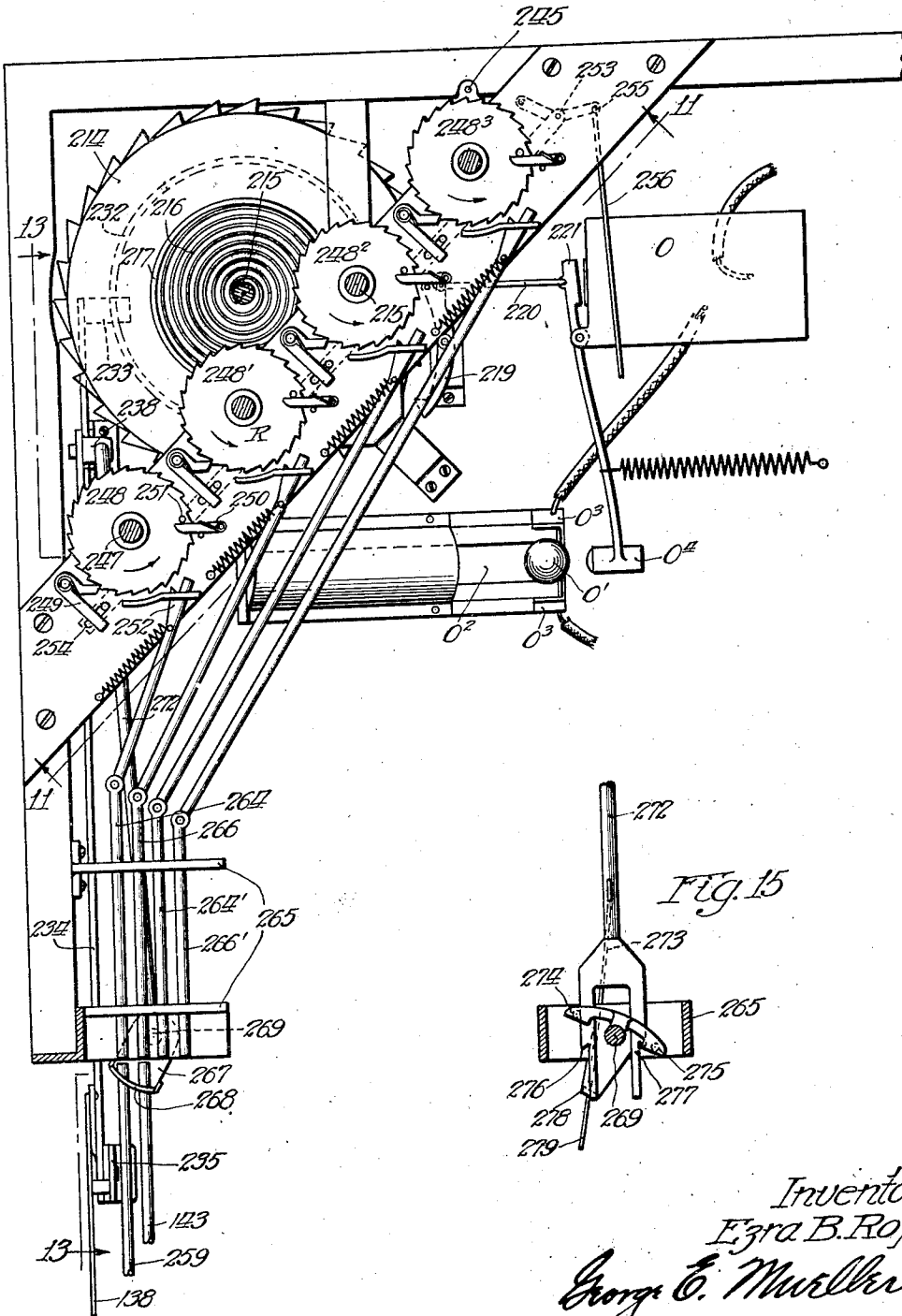
E. B. ROPP  
AUTOMATIC BASEBALL GAME

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FIG. 12



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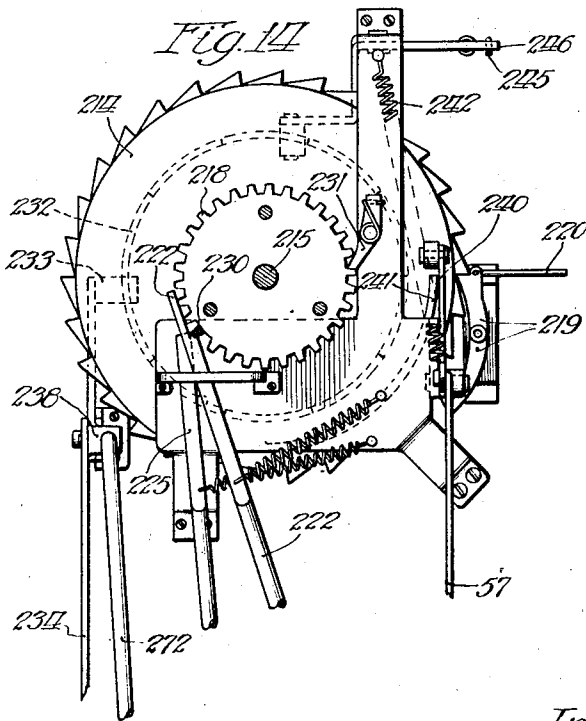
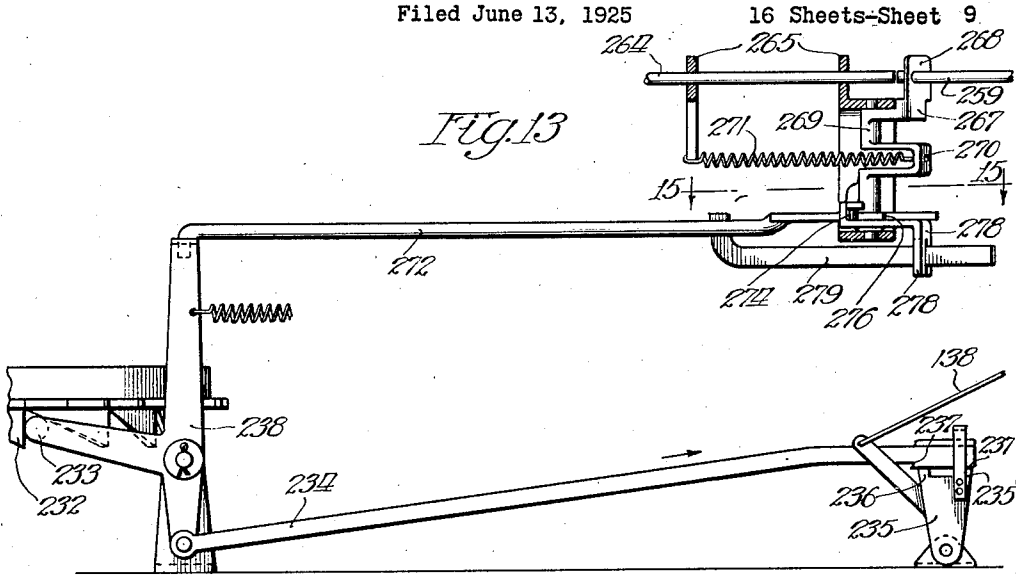
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AUTOMATIC BASEBALL GAME

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16 Sheets-Sheet 9



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E. B. ROPP

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Fig. 16

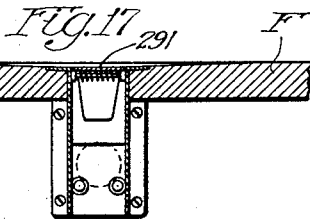
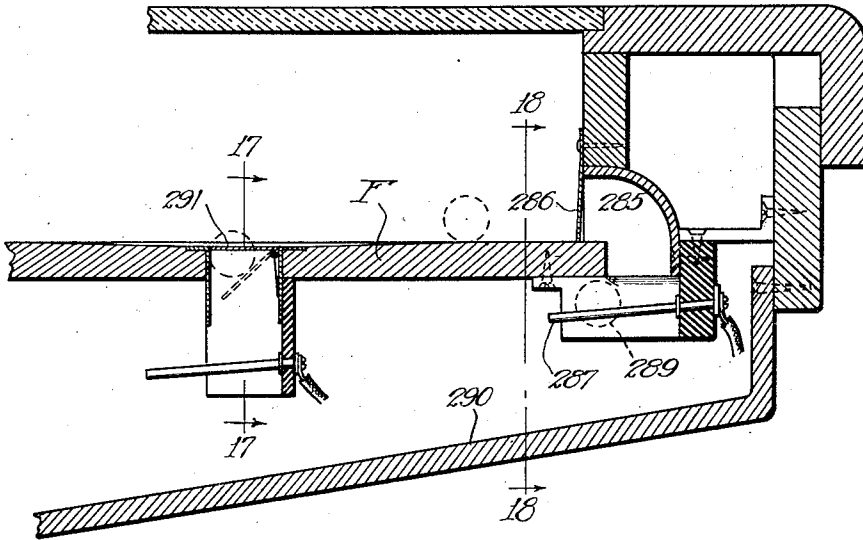
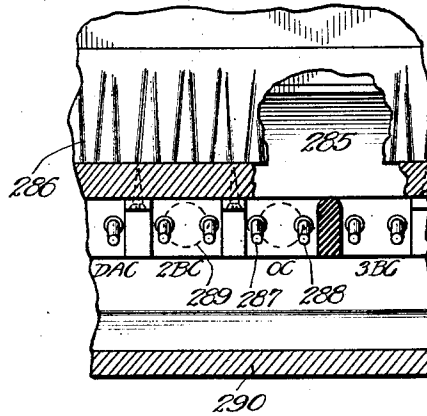


Fig. 18



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16 Sheets-Sheet 11

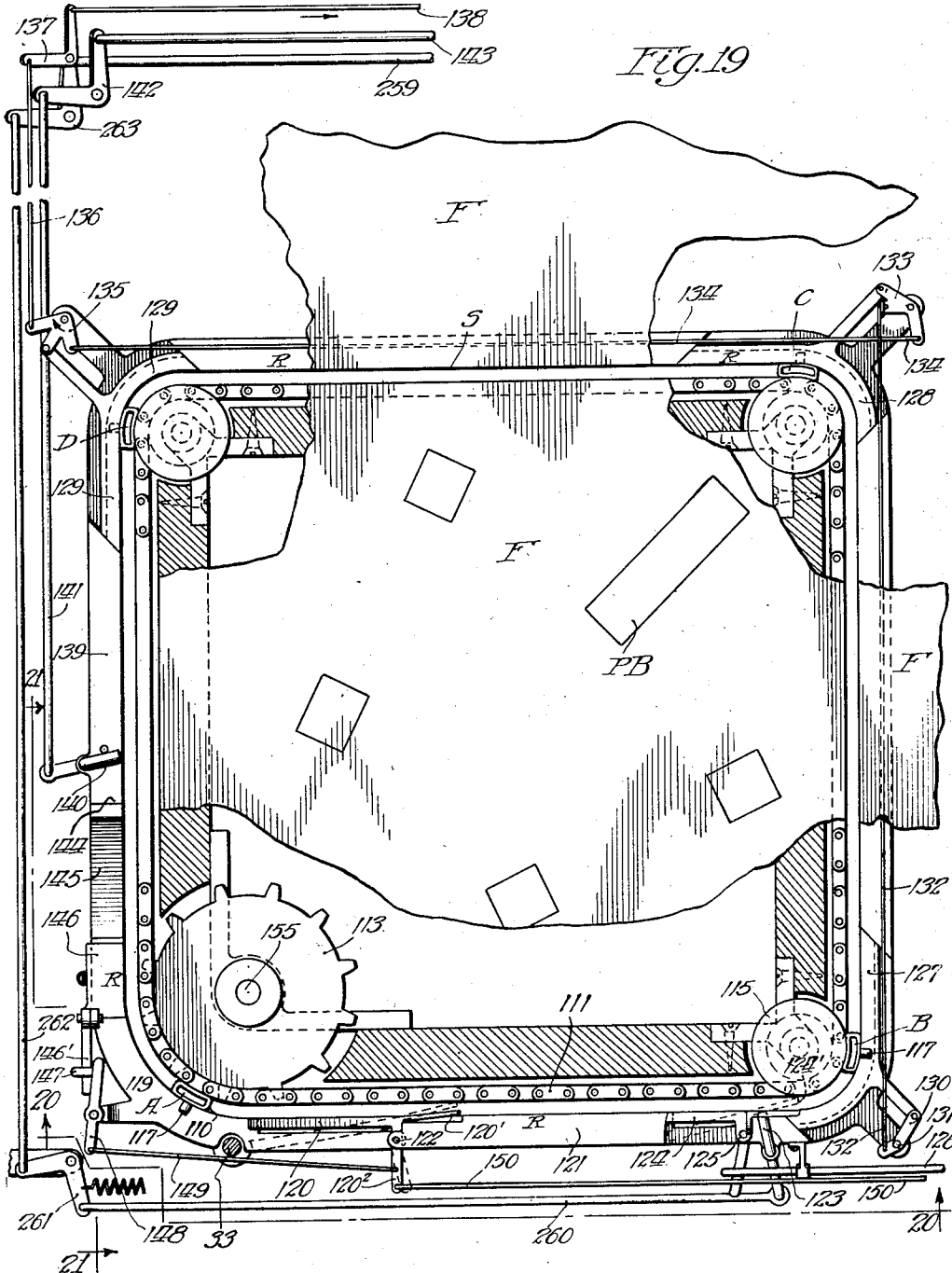


Fig. 19

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By E. C. Muller Atty.

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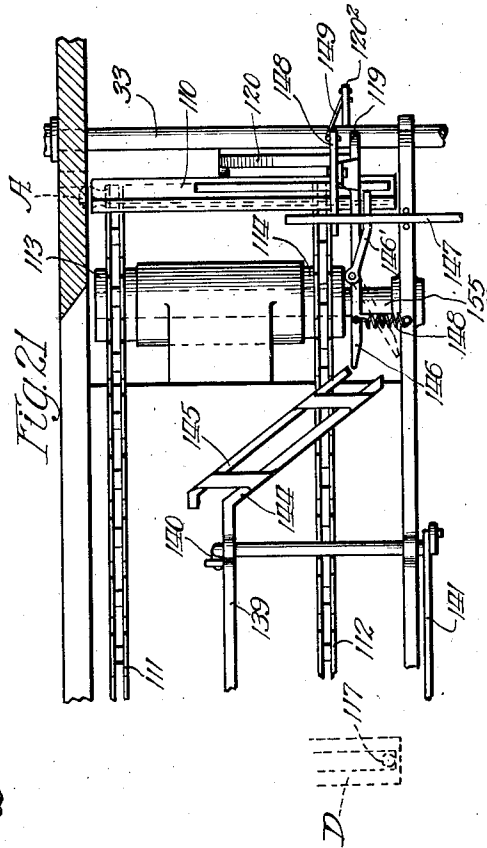
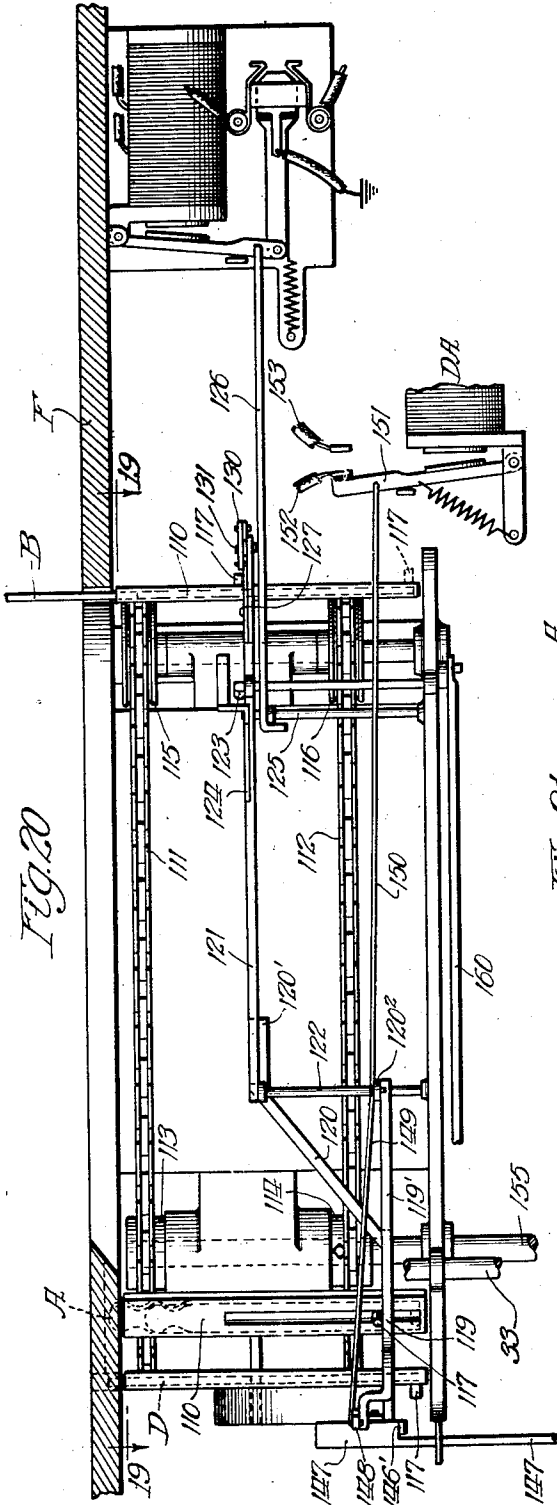
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AUTOMATIC BASEBALL GAME

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16 Sheets-Sheet 12



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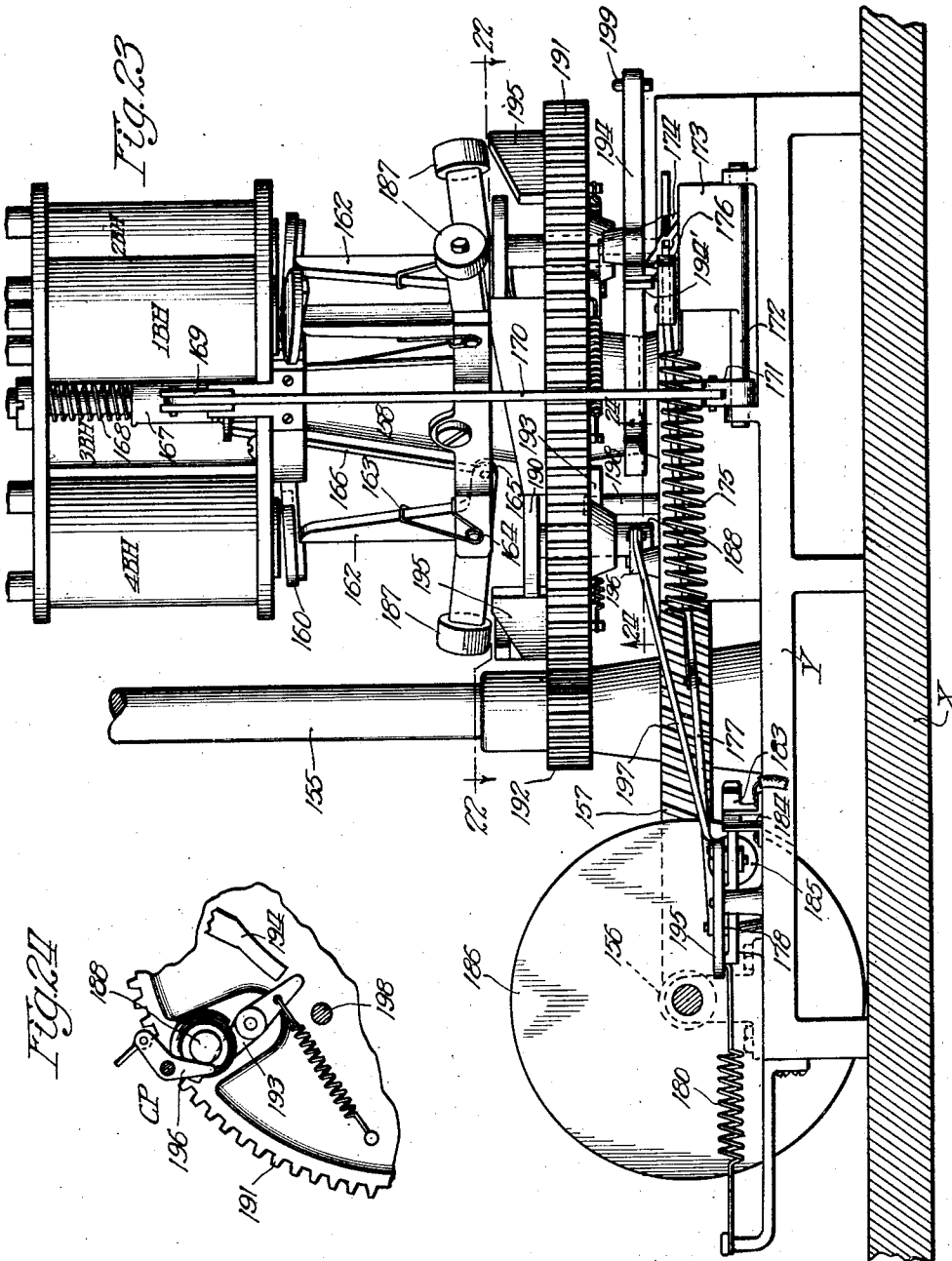
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AUTOMATIC BASEBALL GAME

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16 Sheets-Sheet 14



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E. B. ROPP

AUTOMATIC BASEBALL GAME

Filed June 13, 1925

16 Sheets-Sheet 15

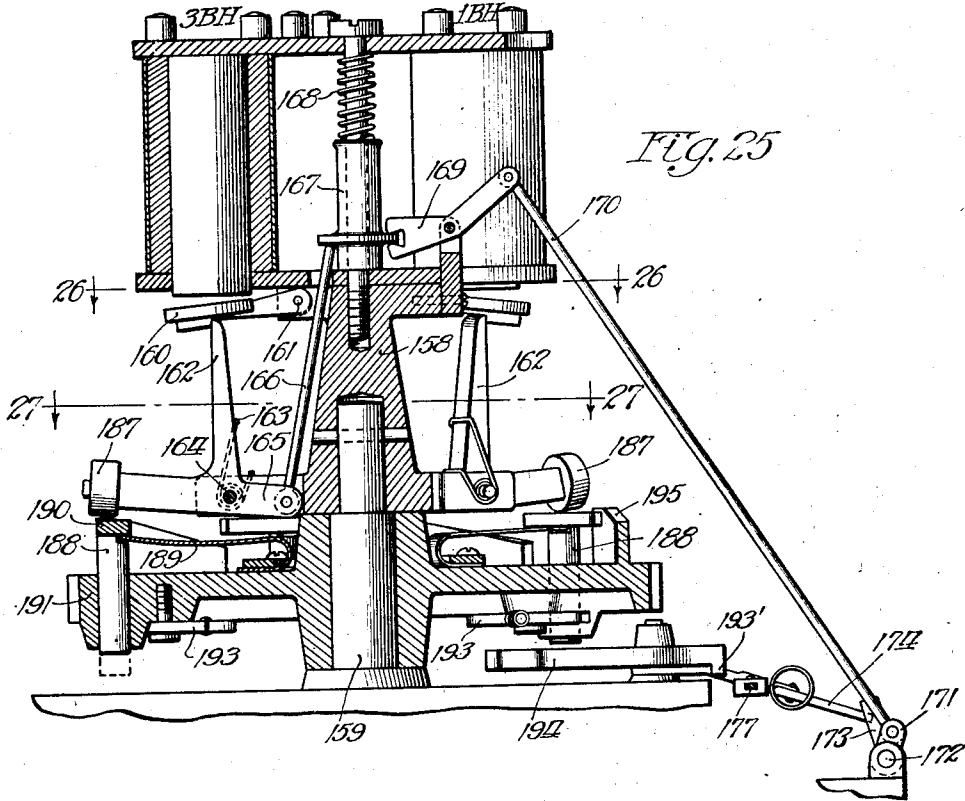


Fig. 25

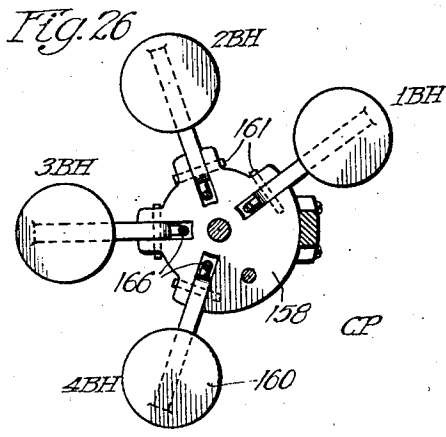


Fig. 26

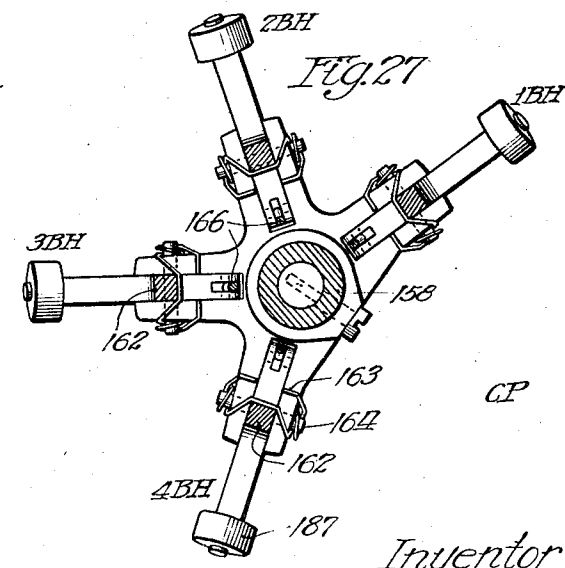


Fig. 27

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Sept. 27, 1927.

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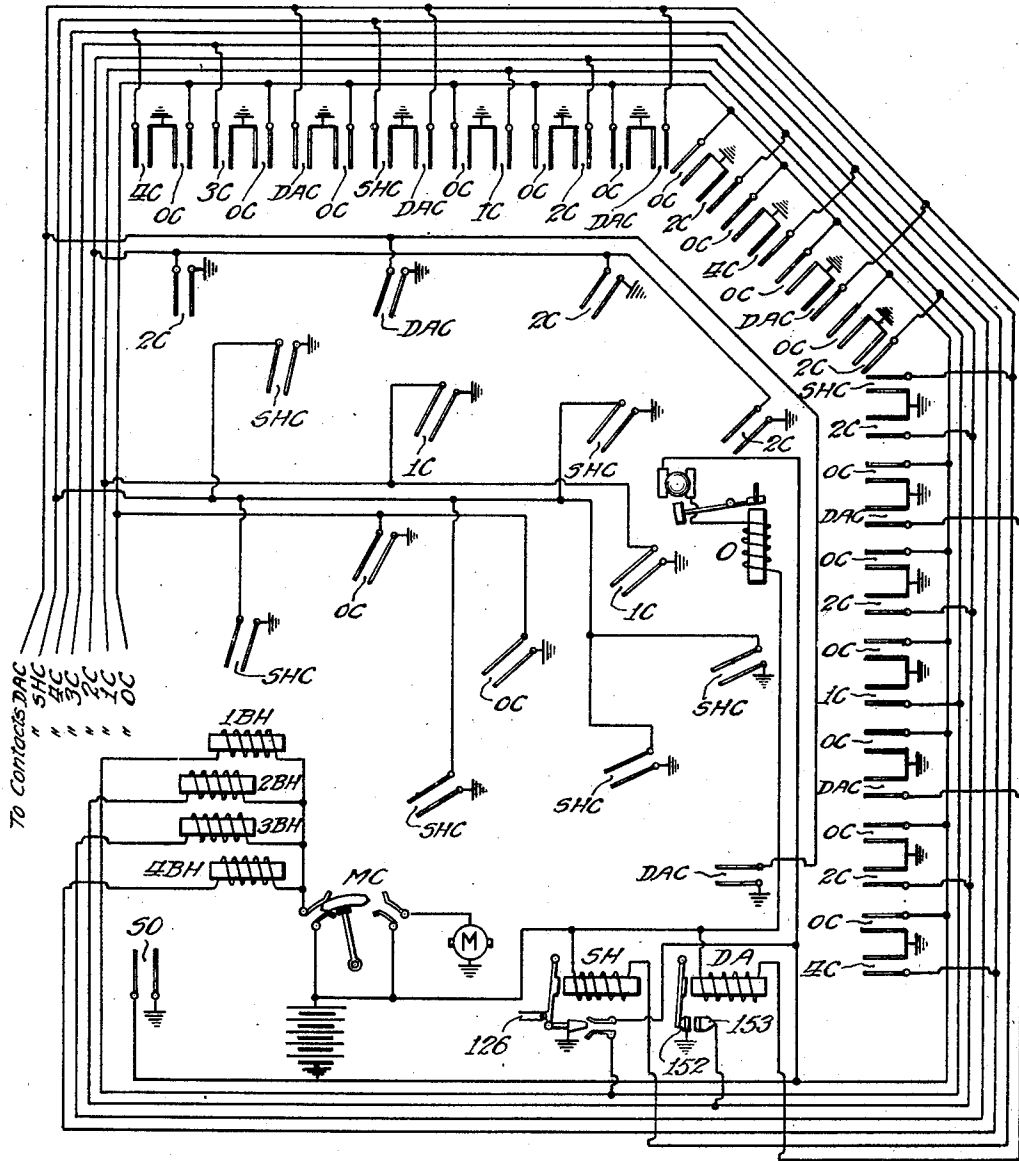
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AUTOMATIC BASEBALL GAME

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*Fig. 28*



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# UNITED STATES PATENT OFFICE.

EZRA B. ROPP, OF OKLAHOMA CITY, OKLAHOMA.

AUTOMATIC BASEBALL GAME.

Application filed June 13, 1925. Serial No. 38,986.

My invention relates to automatic base ball games and has to do more particularly with a machine, or apparatus of the above character adapted to be manually controlled for pitching and batting the ball, together with figures or players automatically advanced on the bases according to the kind of hit that is made, and with scoring apparatus for the same.

The principal object of my invention is to provide a machine or apparatus of the above character adapted to be played in a manner closely resembling an actual base ball game, and in which the results are determined largely by the skill of the player or players. There are many features of my invention and these will be more particularly pointed out in the ensuing portion of the specification and appended claims.

Before taking up the drawings, I believe it advisable to first refer briefly to the preferred device embodying my invention.

In general, a base ball field is provided, having the usual outfield, infield and diamond with base positions, together with a batting apparatus controlled by the operator and a ball feeding and pitching apparatus also controlled by the operator. That is the pitching apparatus is manually manipulated to pitch the ball toward a bat, which is swung by the manual manipulation of the operator. When the ball is hit it is knocked out into the field, preferably by rolling over the surface where it may drop down into any one of a number of different control positions having electric contacts which advance runners over the bases according to the hit made. According to the present form of my invention one, two, three and four base hits may be made. Also sacrifice hits may be made, or the player is put out either by a strike-out or by hitting the ball to certain positions in the infield or outfield. The men are advanced on the bases as in a regular game. That is, assuming the first ball hit is for one base, a runner is automatically advanced to first base. Should the next hit be for two bases, the man on first is advanced to third and the batter advanced to second base, all automatically. Should the next hit be a home run, the two men on base will be advanced around the bases to the home plate and as a result of the home run another player, that is the batter, makes a complete circuit of the bases. Thus as described, three hits have been made

and these would all be automatically recorded on the score board. Also three runs having been made, they would be automatically recorded on the score board. Thus the game continues until one side makes three outs, the outs also being recorded. Then the other side or opponent player controls the machine and continues until three outs are made. Outs and innings are automatically indicated, so that one can always tell at a glance the score of the game and what inning and the number of outs. Where two people are playing the game, first one operates the machine until three outs are made and then the opponent operates it. Or any number on each side may play. This continues up to the capacity of the machine. In the present form of my invention the machine is designed to operate for five full innings, when it is automatically rendered inoperative and requires the deposit of another coin before it can be played again. It is to be understood, however, that my invention is not limited to any particular number of innings, this depending upon the design of the mechanism and which may be extended as desired.

Referring now to the accompanying drawings for a better understanding of my invention—

Fig. 1 is a perspective view of the device as a whole, showing the base ball field, batting control knob B, pitching control handle P and the scoring apparatus at the rear of the field;

Fig. 2 is an enlarged (full size) perspective view showing the batting apparatus;

Fig. 3 is a side elevation looking into the machine from the outside along the third base line, and showing the setting lever and pitching control apparatus with the pitching handle P;

Fig. 4 is a top plan view along the line 4—4 of Fig. 3, also showing some of the ball receiving, storing, feeding and pitching apparatus;

Fig. 5 is a side elevation along the line 5—5 of Fig. 4, showing the ball receiving, storing, feeding and pitching apparatus;

Fig. 6 is a left side elevation along the line 6—6 of Fig. 4, showing some of the pitching apparatus and particularly the parts used for giving a snap or quick pitching action to the ball and also a uniform speed to the pitched balls;

Fig. 7 is a vertical sectional view along

the line 7—7 of Fig. 4, showing the check apparatus for maintaining the fed balls in the chute leading up to the pitching arm;

Fig. 8 is a vertical sectional view through the rotatable pitching control apparatus along the line 8—8 of Fig. 4;

Fig. 9 is a side elevation along the line 9—9 of Fig. 3, showing the holding mechanism for maintaining the pitching arm P in operative relation to the pitching mechanism, the holding mechanism being adapted to be actuated at the termination of five innings to uncouple the pitching arm from the pitching mechanism until the setting lever is operated;

Fig. 10 is a vertical section along the line 10—10 of Fig. 3, showing the retaining pawl for maintaining the parts locked to prevent interference and uncoupling of the pitching arm after it has once been set for a game;

Fig. 11 is a front elevation of the score registering drums shown at the score board at the rear of the field, together with the control mechanism therefor, being along the line 11—11 of Fig. 12;

Fig. 12 is a plan sectional view along the line 12—12 of Fig. 11, showing the score control apparatus;

Fig. 13 is a side elevation partly in section along the line 13—13 of Fig. 12, showing the shifting mechanism for shifting the operating rods from the hit and run score drums for one side to the drums for scoring for the other or opposing side;

Fig. 14 is a plan sectional view along the line 14—14 of Fig. 11, showing more particularly the winding mechanism for winding up the spring for advancing the large central drum which registers the outs and the inning which is being played;

Fig. 15 is a plan sectional view along the line 15—15 of Fig. 13, showing more in detail the scoring rod shifting device;

Fig. 16 is a cross sectional view along the line 16—16 of Fig. 1, that is through the framework at the outer edge of the outfield and showing the ball receptacles or openings for operating the advance and scoring mechanism, this view also showing a field trapdoor adapted to be placed in desired parts of the infield and outfield for controlling the advancing and scoring mechanism as desired;

Fig. 17 is a cross sectional view along the line 17—17 of Fig. 16, showing the trapdoor mechanism and contact makers which receive the ball for controlling the player advancing and the scoring mechanism;

Fig. 18 is a vertical sectional view along the line 18—18 of Fig. 16, showing the pockets or ball receiving positions together with the contact makers positioned therein;

Fig. 19 is a plan view of the player advancing mechanism located immediately beneath the infield, along line 19—19 of Fig.

20, with portions of the field surface broken away to more clearly show the parts, this view also showing portions of the hit and run scoring mechanism, the apparatus being positioned beneath the diamond with the large sprocket wheel at the home plate and the other wheels positioned beneath the corresponding bases;

Fig. 20 is a side elevation of the apparatus of Fig. 19, along the line 20—20 thereof, which is along the line from the home plate to first base;

Fig. 21 is a side elevation along the line 21—21 of Fig. 19, showing more in detail the apparatus for operating the run scoring mechanism and controlling the player figures for properly placing them in batting position;

Fig. 22 is a plan sectional view of the motor and motor control mechanism along the line 22—22 of Fig. 23;

Fig. 23 is a right end elevation in section through the motor shaft along line 23—23 of Fig. 22;

Fig. 24 is a bottom view looking upwardly along line 24—24 of Fig. 23;

Fig. 25 is a vertical sectional view along line 25—25 of Fig. 22;

Fig. 26 is a plan view in section along line 26—26 of Fig. 25, showing the armatures of the base hit magnets;

Fig. 27 is a plan sectional view along the line 27—27 of Fig. 25; and

Fig. 28 is a diagrammatic illustration of the electrical circuit for the apparatus.

Referring now more in detail to the apparatus employed, I will take up the construction and operation of the various units and their cooperation.

#### *Batting apparatus.*

Considering first batting apparatus, the batting apparatus preferably employed is shown in perspective in Fig. 2, although it is to be understood that any suitable device of this character may be used.

This batting apparatus includes a bat preferably of metal so as to give it sufficient weight and also because I preferably use a metal ball, the ball used being an ordinary steel bearing ball of about  $\frac{3}{4}$  of an inch in diameter. The bat is positioned at the home plate, as indicated in Fig. 1, so that as the ball 31 is pitched from the pitcher's box PB it may be met by the bat as the bat is swung, and knocked out over the field as in a regular game. The ball is preferably rolled out over the field when hit, so a comparatively heavy one is used. The bat as positioned in Fig. 1 is for a left handed batter, although this may be shifted as desired. The bat is preferably mounted so that it may be swung in a circle, and to this end is supported upon a vertical shaft rotatably mounted at its upper and lower

ends and carrying a pulley 34 at the lower end. This pulley is connected to an operating pulley 35 by a suitable belt 36 traveling over pulleys 37—38. I interpose a spring 5 39 in the belt so as to keep the belt taut and also give a more resilient or snap action to the bat. The driving pulley 35 is mounted upon a rotatable shaft 40 carrying a batting knob B. A suitable soft stop in the nature 10 of a rubber buffer 41 is so mounted that the bat 30 will stop against the buffer at either end of its swing.

To operate the bat 30, the operator or player grasps the batting knob B and manipulates it, preferably swinging the bat 15 back of the position indicated in Fig. 1 as in a regular game. Then as the ball is pitched, the knob B is rotated clockwise by a short snappy movement so as to swing the 20 bat to meet the ball. After some experience the operator or player becomes expert, so that the ball can be hit in desired directions just as in an ordinary base ball game.

I preferably position the scoring apparatus and connect it so that the hits in this 25 game correspond in a measure to the hits in a regular game. That is, it is known that a ball hit ordinarily to a certain part of the field will give a runner two bases. Then 30 again a ball hit within catching range of a fielder usually will result in an out. Accordingly, I arrange the control contacts around on the field and at the edge of the 35 field so as to give results corresponding to the ordinary game. A player upon becoming expert with my game is enabled to hit the ball most of the time to the more desirable spots, while the poorer player, having 40 less control, is not so successful. Thus, to a great extent, the game depends upon the skill of the player in manipulating the bat in synchronism with the pitched ball.

*Ball receiving, storing, feeding and pitching apparatus.*

Now as to the ball receiving, storing, feeding and pitching apparatus, this is shown 45 more clearly in Figs. 1 and 3 to 10, inclusive.

Generally speaking, the pitching knob P 50 is manipulated, that is the crank is given one rotation for each ball pitched. That is by giving the pitcher's crank P one rotation in the direction of the arrow indicated in Fig. 1, the apparatus is operated to pitch one ball 55 toward the home plate. In the operation of the mechanism, the player preferably stands at the near corner of the table shown in Fig. 1, grasping the batting knob B in the right hand and the pitching knob P in the left 60 hand. Or, of course, this may be reversed if desired. The knob P is then rotated to pitch a ball and as the ball leaves the pitcher's box PB and approaches the home plate, the batter's knob B is manipulated to swing 65 the bat 30 toward the oncoming ball. I preferably

provide mechanism which gives the same speed to the pitched ball irrespective of the speed of rotation of the pitching knob P. That is a tripping mechanism is employed, which is wound up and released so 70 as to always effect the same snap action to the pitching arm which throws the ball out of the pitcher's box PB.

Referring now more in detail to the mechanism referred to, the pitcher's knob P is 75 mounted upon a suitable crank carried by the rotatably mounted shaft 42, which extends downwardly through the outer frame 43 of the cabinet and longitudinally slidably through the clutch sleeve 44 into the hub or 80 crank shaft 45. Shaft 42 carries a yoke member 46 adapted to set down over the stud 47 of sleeve 44, so that the entire shaft 42 may be pulled upwardly out of the hub 45 and out of the frame. That is, the pitching 85 shaft may thus be freed from the entire apparatus to prevent its operation by simply pulling out the pin 48, thereby detaching the holding arm 46 from the shaft and permitting the shaft 42 to be pulled upwardly. 90

Normally with the apparatus inoperative, the clutch sleeve 44 is in its upper or dotted position with the clutch finger 49 clear of 95 the hub 45, the clutch operating lever 50 also then being in its dotted position to hold the clutch parts 49—45 disconnected. By normally I mean with the pitching shaft disconnected. This clutch operating lever 50 is 100 pivotally supported upon a stud 51, which also carries a lever 52 connected by a link 53 to setting lever 54 which is manually actuated so that the lever 52 may be dropped 105 downwardly so that the pawl 55 carried at its end may hook over the clutch operating lever 50 when it is down in its dotted position and then lift it up into its full line position, as shown in Fig. 3, to put the clutch 110 finger 49 in operative engagement with the hub 45.

It might be mentioned at this time that 110 the machine is preferably arranged to disconnect the pitching crank at the end of five innings of full play, and for this purpose release arm 57 (Fig. 9) is moved toward the 115 right to hook over tail piece 55' of the pawl, so that when release arm 57 moves toward the left again the pawl 55 is pulled free of the lever 50, allowing it to be pulled downwardly by the spring 58 into its dotted line 120 position, thereby lifting the clutch member 44 with its finger 49 clear of the driving hub 45 and thereby disconnecting them. It will be noted that release arm 57 is supported in a guide 60, which is curved on a 125 radius with shaft 51 as a center so that this arm 57 may follow down with the tail piece 55' for a short distance, but still remain in operative relation. This is so as to permit locking cooperation of the clutch, although 130 the setting lever 54 is not fully moved to its

limit of movement. In other words, to take care of slight differences in manual operation of the setting lever.

In order to retain the levers 50—52 in their upper position and thus maintain the clutch parts locked together, I provide a locking pawl 61 pivotally mounted at its lower end and spring pressed toward the lever 52, so that the teeth in the locking pawl 61 (Fig. 10) will engage the inclined tooth 52' and hold lever 52 in its upper position. The locking pawl 61 is held in a guide 52<sup>2</sup> to prevent side play.

It will be noted that the pawl 61 has a peculiar cam shape at 61' (Fig. 10), so that when locking lever 50 is released at the time holding pawl 55 is operated, said lever drops downwardly and engages this cam portion 61' so as to move pawl 61 and release it from the lever 52, permitting lever 52 to be moved downwardly for a subsequent operation by manual setting lever 54 when the machine is to be started in play again.

I have referred to the manual setting lever 54 as being preferably under coin control and I have shown in Fig. 1 a coin receiving device 63, which may be of any suitable construction and in which a slide 64 is mounted, which extends through to the end shown in Fig. 3 which is connected to the slotted end of arm 54. Thus when a coin is deposited, slide 64 may be pulled outwardly, thereby pulling lever 54 to the right to its extreme position, and then slide 64 is shoved back restoring lever 54 to its position of Fig. 3, this reciprocation bringing the pitching shaft into cooperative relation with the pitching mechanism through the clutch 45, as already referred to. This reciprocation of slide 64 releases the cam and the slide and lever 64 are locked until the end of the game and deposit of another coin.

Referring now to the ball receiving, feeding and pitching apparatus, which is controlled by the rotation of the pitching crank P, and which apparatus is more particularly shown in Figs. 1 and 3 to 10, inclusive, this said mechanism is controlled through a link 65 carried upon the eccentric or crank 66 (Fig. 4) of the hub 45, which is rotatably supported upon the bearing 67. Thus when the pitching shaft 42 is rotated the eccentric 66 is rotated one turn, thereby giving a complete reciprocation to the link 65. This link is connected to an arm 68 pivotally connected to a link 69 which extends back to the feeding and pitching apparatus shown more clearly in Figs. 4, 5, 6 and 8.

This pitching control unit is connected through said link 69 back to the operating lever 68 as previously stated, and this unit comprises a main shaft 75 which with its supported parts are carried by the bracket bearings 73—74 mounted upon the main base X.

Rotatably supported upon the shaft 72 is a sleeve 75, rigidly attached to which is the arm 76 having a rear extension 77 to which the operating link 69 is pivotally attached; said arm 76 also carrying a pawl 78 with a releasing tail piece 78'. Thus as the link 69 is reciprocated through the action of the pitching knob, said arm 76 and sleeve 75 are reciprocated upon the shaft 72, moving the pawl 78 from its full line position indicated by the tail piece 78' (Fig. 6) to the dotted line position as shown in Fig. 6. This pawl 78 is adapted to engage the tooth 79 on the plate 80, which plate is carried by a hub 81 freely rotatable upon the shaft 72. This hub 81 also carries an arm 82 having a pawl 83 mounted upon its end and adapted to be moved back into its dotted position (Fig. 6) to engage the tooth 84 of a plate 85 carried by hub 86 and securely fastened to the shaft 72. Both the pawls 78 and 83 are spring pressed, that is with the nose being pressed toward their respective plates 80 and 85, but both pawls in their full line position of Fig. 6 are being held clear of their plates by the releasing stops or cams 87—88 respectively. The pawl 78 is shown with its tail piece engaged by the stop 87, which stop is engaged as the pawl is moved counter-clockwise (Fig. 6) by the return movement of link 69, thereby lifting the pawl free of the tooth 79 to release the plate 80 for a purpose hereinafter described. Tail piece 83' of pawl 83 carries a lateral extension 83<sup>2</sup> to engage the under side of rod 89 to act as a stop and prevent too far rotation of the pawl 83 on its pivot if it should be moved back clear of the plate 85. Similar stop pieces are provided for the pawl 78, as shown adjacent the tail piece 78' in Fig. 8.

Each of the plates 80—85 are spring restored through chain and spring connections. That is, plate 80 has a chain 90 fastened to its hub 81, which chain is attached to a spring 91 the tension of which may be varied by a manually adjustable lever 92 so as to vary the action of the spring and by which it is possible to vary the speed of pitched balls if desired. Plate 85 has a chain 93 attached to its hub 86, said chain being fastened to a spring 94 for restoring the plate 85 and shaft 72, as will be hereinafter described. The rotation of this shaft 72 effects the pitching operation of the pitching arm PA through the link connection 95, which is pivotally connected at its upper end to the pitching arm and at its lower end to a crank arm 96 rigidly fastened to shaft 72. Thus for each reciprocation of the crank arm 96, the pitching arm is operated to throw a ball. The link connection 95 has a spring 97 interposed therein so as to give a quick snapping pitching movement. That is, it is a more snappy movement than if the entire link 95 were rigid.

The pitching arm PA is formed up of sheet metal with a pocket 98 to receive a ball 102, with side plates 99 adapted to engage and lift a flush trapdoor 100 as the arm is swung on its pivot 101, so that the ball 102 is thrown forwardly toward the home plate, as indicated by the dotted line positions in Fig. 5. The trapdoor 100 is spring restored and controlled so that the opening through which the arm moves and the ball is thrown is covered upon the restoration of the pitching arm before the ball can be batted out over the pitcher's box.

In order to feed the balls to the pitching arm, they pass from the receiving hopper 70 through the runway 103 into the elevating or feeding tube 71. To elevate the balls so that they may roll into the pitching arm, I provide a feeding arm 104 which projects into the elevating tube 71 and is adapted to receive a single ball and raise it in the tube a distance equal to the diameter of one ball, thereby raising those balls in advance of it so that the top one in the tube will roll over into the pitching arm. This feeding lever 104 is actuated from the sleeve 75 on shaft 72 by means of a link 105 (Fig. 5) connected to a crank arm 106 rigidly fastened to this sleeve 75. The crank 106 is indicated by the dotted lines in Fig. 5. It will be noted that lever 104 has a downward extension 104' shown by dotted lines in Fig. 5, so as to prevent another ball from being fed into the tube while one ball is being raised. In order to retain the balls in their lifted position I provide a pair of retaining pawls 107, shown in detail in Fig. 7, and which permit a ball to be lifted upwardly past these pawls, but when the lever 104 moves downwardly the pawls snap back into holding position to prevent the balls from dropping back.

*Operation of receiving, storing, feeding and pitching apparatus.*

Now as to the operation of the above said apparatus just described and shown in Figs. 1 and 3 to 10, inclusive, and assuming that the pitching crank P has been placed in operative relation with the actuating crank 65 carried at the lower end of the shaft 42 and that the parts of Fig. 3 are in the position there shown by the full lines, the crank P is given one rotation in a clockwise direction. This causes a complete reciprocation of the link 65, lever 68 and link 69. This first draws the link 69 back toward the operator (Fig. 4), which means toward the right in Fig. 6 and toward the left in Fig. 5 thereby drawing arm 76 and pawl 78 back into the dotted line position of Fig. 6, where the pawl 78 snaps into the tooth 79 of the plate 80. This occurs at the completion of the pulling movement of link 69. During this movement of link 69 the ball feeding apparatus is actuated to feed a ball into the pitching

arm PA. This is brought about by the upward movement of link 105 (Fig. 5), which moves the feeding arm 104 upwardly, feeding the stored balls 102 upwardly so that the uppermost ball rolls over into the pocket 98 of the pitching arm in preparation for the throwing operation of this arm.

The lever 68 and link 69 now start their return travel responsive to the last half of the rotation of the pitching crank, and the pawl 78 having engaged the tooth of plate 80 as shown by the dotted lines of Fig. 6, carries this plate along with it in a counter-clockwise direction (Fig. 6), thereby also carrying the pawl 83 around until it engages tooth 84 of plate 85. This advance of plate 80 is against the tension of the spring connected to chain 90 and after pawl 83 has snapped into tooth 84, pawl 78 is released from plate 80 by engagement between tail piece 78' and extension 87, so that the spring pulling upon chain 90 rapidly rotates plate 80 and plate 85, (through the connection from pawl 83) in a clockwise direction (Fig. 6), thereby also advancing or rotating shaft 72 so as to lift the link 95 to operate the pitching arm PA. This clockwise rotation of shaft 72 and plate 85 is through an arc of about 90 degrees, that is until the tail piece 83' of pawl 83 strikes the release stop 88, causing the nose of the pawl 83 to disengage from tooth 84, whereby plate 85 and shaft 72 are restored in a counter-clockwise direction through the action of the spring connected to chain 93, until the plate 85 engages the stop 108 (Fig. 6). The restoring movement of plate 85 and shaft 72 restores the pitching arm.

This operation has given a quick action to the pitching arm PA, so that this arm as it is raised out of the box throws the ball 102 directly on a line with the home plate. As previously stated, the ball used is preferably a steel bearing ball and rolls along on the surface of the field, the bat being placed so that it can meet the ball if properly manipulated.

In the pitching apparatus which I preferably provide and as shown herein, it is to be noted that due to the spring actuating and release mechanism employed, the pitching arm, and consequently the ball, are always actuated at the same speed irrespective of the speed of rotation of the pitching knob P. That is, this pitching knob is simply used to wind up the pitching apparatus, which is then automatically released and advances always under the same speed and out of control of the operator. Of course, as previously referred to, I have provided a spring adjusting lever 92 (Fig. 4) which may be mounted in a convenient place on the outside of the machine and under the control of the opponent, so that the opponent may vary the adjustment of the spring 91 unknown to the

player and thereby change the speed of the pitched ball, in an attempt to fool the batter by fast and slow balls as in an ordinary game.

Thus it will be seen that for each rotation of the pitching crank P, a ball is fed into the pocket of the pitching arm and then pitched over the home plate, the trapdoor opening to permit the pitching of the ball but restoring to provide a flush or unbroken field before the ball can be batted out over the pitcher's box.

#### *Electrical circuit diagram.*

Having described the pitching and batting mechanism, I will now take up the base running mechanism and the electrical control apparatus therefor, but I believe it will be more readily understood by first taking up the circuit diagram shown in Fig. 28.

In general, I will say that player figures are provided, one of them being shown at second base in Fig. 1, which figures are so mounted and controlled that they run out the various hits made, as in a regular game of base ball and register hits on the score board. These figures are mounted and are normally maintained beneath the playing surface and only appear in response to a hit, at which time a figure is forced up through a slot S in the playing field between the home plate and first base and then advanced according to the hit. If it is a one base hit the figure is advanced to first base. Other hits advance the figure accordingly. Assuming a man is on first base and a two base hit is then made, the man on first base is advanced to third and the batter is advanced to second base. This leaves a man on second and third. Should the next hit ball result in a home run, a third player appears, making a circuit of the bases and the men on second and third are advanced to the home plate where they disappear. As these figures approach the home plate, runs are scored and registered as in a regular game. The apparatus is also arranged so that sacrifice hits may be made. That is, if a ball is hit to certain parts of the field and assuming there is a man on third base, a runner appears and is advanced toward first base but again disappears through the slot (because he has made an out) before a hit is recorded. However, the runner at third advances to the home plate and a run is scored and registered. Also should a ball be pitched and the batter fail to hit the ball, it goes right on over the home plate and registers a strike. In the preferred form of my apparatus and as shown herein, a single strike results in a strike-out. Also if the ball is hit to certain parts of the field it will result in an out.

Thus the control apparatus is arranged to

advance runners and score hits, runs and outs as in an ordinary game.

As previously stated, I believe an understanding of the circuit arrangement, before going into a detailed description of the player advancing and control mechanism, will make the apparatus more readily understandable.

Referring now to the circuit diagram Fig. 28, I have shown pairs of contacts positioned at various points on the field, these pairs of contacts being arranged to be closed by the action of the ball as it is hit into engagement with these contacts, the preferred construction being such that the ball itself drops across the contacts to close the circuit. Now as to these contacts, I have shown various sets, those marked 1C being the one base hit contacts and being connected to a one base hit magnet 1BH. That is, whenever the ball drops on one of the contact sets 1C, the one base hit magnet 1BH operates to advance the batter to first base and advance any men on base one base. Likewise I have also provided a two base hit magnet 2BH, a three base hit magnet 3BH and a four base hit magnet 4BH. These magnets are controlled by corresponding contacts, that is two base hit contacts marked 2C, three base hit contacts marked 3C and four base hit or home run contacts marked 4C.

I also provide a sacrifice hit control, and place sacrifice hit contacts marked SC preferably at positions on the field which in an ordinary game would result in a sacrifice hit. These contacts SC are connected to a sacrifice hit magnet SH, which magnet does three different things. First of all, it closes a circuit through the one base hit magnet 1BH, the operation of this latter magnet resulting in the operation of the advancing mechanism to advance any men on base to the next base. This, it will be noted, is the same as in an ordinary game. That is, the sacrifice hit is credited when one or more players on base are advanced although the batter is put out. This magnet SH also operates the out magnet O, this magnet being operated whenever a hit results in an out. As the player who made the sacrifice hit is supposed to be put out, the operation of this sacrifice hit magnet results in the operation of the out magnet to register an out on the scoring apparatus. This sacrifice hit magnet does a third thing, that is it puts the batter out of play by dropping the batter that is running from home to first base before this batter reaches first base. So that although a player started for first, as a result of this sacrifice hit, he drops out of sight before reaching the first base because he is put out as in an ordinary game.

I also provide out contacts OC at various points around the field, being prefer-

ably placed at points which ordinarily result in an out. Thus when the ball is hit to close the circuit at any of these out contacts OC, the out magnet O is operated to register an out.

I also provide what I call a double advance control. That is, any runners on base are advanced two bases, while the batter only advances to first. This corresponds to a play which frequently takes place in a regular game. That is, a batter makes a one base hit and advances to first base, but the men on the bases will advance two bases. For example, a man on first will advance to third, while a man on second will come all the way home. This so-called double advance is controlled by the double advance magnet DA. This magnet closes a circuit for the two base hit magnet 2B and at the same time controls mechanism which puts a single man only on the base as the result of the hit. The contact sets for controlling this double advance magnet are marked DAC.

I also provide a strike-out control, positioning contacts SO for this control immediately back of the home plate. Thus if the ball is missed by the batter, it continues on over the home plate, dropping through an opening and closing these contacts SO. In my preferred mechanism and as used herein, a single strike results in an out. Thus when the contacts SO are closed they close the circuit for the out magnet O which registers an out on the score board.

In order to operate the player advancing mechanism, I preferably employ a motor M which motor is operated to advance the men whenever a hit is made. The motor is preferably normally inert and operates only whenever one of the four hit magnets is operated, these four magnets having a common connection extending to the motor control switch MC. Thus when one of these magnets is operated, the switch MC is moved over to close the circuit for the motor and open the circuit for the magnets, so as to prevent false or successive operations of these magnets by accidental chattering of the ball contact closer when the ball drops on the contacts.

#### *Player advancing mechanism.*

Having described the circuit diagram and in general its control of the mechanism, I will now take up the player control mechanism as shown in Figs. 19, 20 and 21, and then the motor and motor control apparatus as shown in Figs. 22 to 27.

In the player and player control apparatus I preferably use four player figures for the bases, because there are never more than four men on the bases at one time, and these figures are normally all positioned beneath

the playing field F and are moved upwardly through a slot S and advanced on the bases only when a hit of some kind is made. These four players marked A, B, C, D are slidably supported each in a socket 110 vertically supported upon endless chains 111—112 passed around four sets of pulleys, one set being positioned beneath each base. The pulleys beneath the home plate are in the form of driving sprockets 113—114, while the pulleys 115—116 at the other three bases are shaped to suitably hold the chains taut. The pulleys and chains are so proportioned that a single revolution of the driving sprockets will advance the chains a distance from one base to the next, this being a one base travel of the runner or player. This main driving sprocket is operated from a motor apparatus, which will be later described. Although each time the player advancing chain is operated, all the players are advanced, only the player or players above the field are in play, those beneath being out of play.

Positioned immediately above the line of travel of the players is the slot S through the playing field F, which does not continue around the home plate position. This is for several reasons, one being that it keeps the field at the home plate continuous and uninterrupted so that the ball when pitched will maintain a straight course. Also the players are maintained beneath the field, and the batting player rises above the field only when the advance of the players is started after a hit is made. Also the player coming home from third is dropped before the home plate is reached, so that it is not necessary to continue the slot. Furthermore, this provides a support for the diamond inside the base lines, that is, the support extends across the home plate section so that no support is needed out in the players' field which might be an obstruction to a hit ball.

In order to guide the player figure and properly position it above or below the field, according to the play being made, each player is provided with a guiding pin 117 which slides up and down through a slot in the side wall of the socket 110. In order to guide the figure by the pin 117, a runway R extends all the way around the base line under the field, but this runway is divided up into differently operable sections so as to raise and lower the figure according to the play being made. Normally the four player figures are all below the playing field, that is at the beginning of the game or at the beginning of either half of any inning. In the drawings player A is shown at the home plate, player B at first base, player C at second base and player D at third base, although after the game has started these players may be at any position. That is, at the

end of the first inning, for example, the chain may be so that player A is at second base and the other players at correspondingly other bases. At the end of any inning, that is on the third out, all players still remaining on base, that is in play above the playing field, are automatically dropped by the release of the corner sections of the runway R, remaining below the field ready for the next play.

Now taking up the control runway more in detail and starting at the home plate, it will be noted that player A, assumed to be the batter, is resting below the field with the pin 117 supported upon the stationary home plate corner section 119. We will now follow this runway R, beginning with this home plate corner section 119 and continuing around the bases in the ordinary way, that is to first base and on around. That is, as the man is advanced toward first base in response to a hit, the pin 117 rides up the incline 120 to the upper runway stationary section 121, thereby raising the player above the field so he shows as a runner going toward first base. However, in certain plays, for example where the batter has made a single hit but players on bases are advanced to bases, (which I term a double advance), the chain has moved the distance of two bases. But the batter has only made a one base hit. So in such an advance two pass the home plate corner, the one that was there in the batting position and the next man coming in from third base position. One of these two men only, however, comes into play so one of the two is not permitted to go up the runway incline 120. Therefore this incline section 120 is pivotally mounted upon a shaft 122, so that the section 120 may be moved outwardly into the position indicated by the dotted lines in Fig. 19, whereby the figure coming along will have its pin 117 continue on the lower runway section 119 and on to 119', where the pin drops down over the end to keep this man below the field and out of play. Thus the incline section 120 having been moved out of the path of pins 117 must be brought back again. This is effected by the extension 120' which has been thrown out into the path of the socket 110 of this first advancing man, so that as this socket moves along it engages the tail piece 120' and moves the incline back into position to receive and elevate the next man. The play bringing in this operation will be subsequently described.

Assuming that the advancing runner has been elevated to section 121 and thus appears above the field as an advancing player, the player continues on toward first base passing lever 123, thus operating the scoring apparatus to register a hit. This scoring apparatus will be described later on. The runner continues on to first base (assuming a one base

hit has been made) and comes to rest at the position indicated by man B in Fig. 19.

It is to be noted that as this runner was advancing toward first base the pin 117 passing beyond fixed section 121, passes over section 124 of the runway R before reaching first base. This section is also a movable one and adapted to be moved out of the runway to drop the man at this point before reaching first base, and also before reaching the run recording arm 123. This section 124 is operated when a sacrifice hit is made, that where the batter is put out but runners on base are advanced.

In this respect the mechanism corresponds in play to a regular game. That is, assuming there is a player on any of the bases and the batter hits the ball to a sacrifice hit section to close a pair of sacrifice hit contacts, although runners already on bases are advanced a single base, the batter who is advancing toward first base is taken out of play before the base is reached because he is supposed to be put out. This is done by operating the section 124 on its pivot shaft by means of the link 126 connected to the armature of the sacrifice hit magnet SH. It is also to be noted that this section 124 is located in advance of the hit recording lever 123, so as to take the man out of play before the pin 117 reaches the scoring lever 123. When the advancing runner is dropped through the section 124, the pin 117 drops down to the position indicated by the dotted lines of man B in Fig. 20, thus putting him below the playing field out of sight.

Assuming, however, that the runner has been advanced to first base by a hit and is still in play, this runner will be in position B as indicated in Fig. 19 with the pin 117 resting on the runway R.

Assuming also that this runner has made first base on the first hit with no outs, but that the next three hits made result in outs without advancing this runner off of first base. This ends the inning and therefore I preferably take any players still on base out of play, that is drop them off the field. It may be that at such a time there will be one, two or three runners on bases. So in order to take these men out of play, I provide movable corner sections at first, second and third bases, which sections are supporting runners who may be at these bases, so that when the sections are pulled out of place the runners at these bases will drop. These three movable corner sections, 127 at first base, 128 at second base and 129 at third base, are slidably supported so that they may be pulled directly outwardly away from the base position. The three sections are automatically simultaneously operated upon every third out, and to this end are suitably linked together. For this purpose section 127 is connected to a lever 130 pivoted at 131 and

linked by a rod 132 to an operating lever 133 connected to the section 128 at second base. This lever 133 is then connected by a rod 134 to a lever 135 at third base, which lever is connected to section 129. This lever 135 is actuated by suitable mechanism at every third out, so that when this lever is rotated in the direction of the arrow indicated thereon, it pulls section 129 out of the runway path and likewise sections 128 and 127. This actuating mechanism for operating these sections is preferably controlled at the scoring mechanism, which is positioned back of center field as shown in Fig. 1. Therefore I run a connection from lever 135 around to this mechanism by means of a link rod 136, bell crank lever 137 and link 138. Thus when link 138 is pulled in the direction of the arrow indicated thereat, the three sections are withdrawn to drop the men.

The scoring mechanism to which this link 138 is connected will be subsequently more clearly described.

Coming back to the runway R, except for the three movable corner sections the runway is continuous around from first base to a point between third base and home plate, and maintains the players above the field as in play once they have been put up there and arrive safely at first base.

Now taking up the section of the runway between third base and home plate, a runner advancing from position D at third base toward home travels along stationary section 139 and past the run scoring lever 140, operating this lever to score a run on the recording apparatus. This recording or scoring apparatus as previously stated is positioned back of the center field and therefore I run a connection from this scoring lever 140 around to the scoring apparatus, by means of the link 141, bell crank lever 142 and rod 143, which is suitably connected to the scoring apparatus and which will hereinafter be more fully described.

Continuing with the runway R from third base to home plate, after passing section 139 we come to the downturned or inclined section 144 which takes the man out of play, that is down from the field after the figure has passed the run scoring lever 140 and before it reaches the batting position at A. This downturned portion has an upper section 145, so as to positively engage the pin 117 of the advancing figure and force the figure downwardly even if it does not drop by gravity as it should do.

We now come to a switch arm 146, which is adapted to assume two positions, that is the full line position of Fig. 21 or the dotted line position. When this runway switch 146 is in its upper or full line position, the oncoming player is forced down into a position where the continued advance will take it below the home plate runway section 119.

Therefore the further advance of this player toward first base will keep it below the playing field, because the lifting pin 117 is traveling below the section 119 and continues on beneath section 119', so that the figure will not be brought up into play until it comes around again through subsequent plays and approaches the switch arm 146 again. This action is used because of certain plays, as it is not desirable to have all of the figures above the field at all times, but only as in real plays. For instance, if the man at bat is advanced two bases because of a two base hit, unless some means are provided for eliminating one of the next two men as they come along, both men following the batter would be put into play and instead of having only a man on second base as a result of the two base hit, we would have a man on second and another one unwittingly on first. So by the use of switch arm 146 the players are properly controlled to prevent this.

As described, that is with the switch arm 146 in its up or full line position, the advancing player was put out of play by having the pin 117 advanced beneath the switch arm 146. However, if this man is to be kept in play, or put up into position as the next batter, then switch arm 146 is dropped to its dotted line position so that the oncoming pin 117 will ride on top of arm 146 and then continue on to home plate section 119, as indicated by player A in Fig. 19.

This switch arm 146 may be operated in several ways, one of them being by the lifting of rod 147 (controlled from the motor mechanism), which rod has an overhanging portion resting on the tail piece 146'. Thus when rod 147 is lifted, the switch arm 146 is drawn downwardly by the spring 148.

Another method of releasing switch arm 146 is when the double advance magnet DA is operated as a result of a double advance hit. That is, a one base hit by the batter, but an advance of two bases by the men already on base. It will be apparent that with a player on second base and a double advance hit being made by the batter, the player on base is to be advanced two bases while one player only (representing the batter) is to be put on first base. This means that the driving mechanism is operated the same as a two base hit, that is two revolutions of the driving sprocket 113 and the advance of the chain for two bases. This also means that two men are being advanced past the home plate. But only one of these men must be put into play on first base. To do this switch arm 146 is actuated to switch one of the two advancing men above the runway and one beneath the runway. In other words, it selects one only of a plurality of advancing players.

When the switch arm 146 is actuated as a result of the double advance play, the rod

147 with the hooked end is moved laterally off of the tail piece 146' by the action of lever 148, which is connected by the rod 149 to arm 120' and then by rod 150 to armature 151 of the double advance magnet DA. Thus the attraction of armature 151 operates arm 146.

It would probably be well to explain more fully at this time the actuation of the mechanism upon a so-called double advance hit. When such a hit is made the circuit for the double advance magnet DA is closed, thereby closing its contacts 152 and 153 to close the circuit for the two base hit magnet 2BH, which causes the operation of the motor mechanism to rotate the main driving sprocket 113 for two revolutions. (This motor mechanism will be later described.) So that to begin with, we have the chain advancing for the distance of two bases, which means that all of the players, whether in play above the field, or out of play beneath the field, are likewise being carried along for two bases. But we will assume that when this hit was made no men were on base, that is all were below the playing field. Returning to the double advance magnet DA, upon its energization its armature 151 pulled the link rods 150 and 149, thereby moving the runway inclined switch section 120 from its normal path to its dotted line position. This magnet operation also through the link connections described pushes rod 147 to one side, allowing switch arm 146 to drop down into its dotted line position. The operation of sections 120 and 146 is simultaneous with the starting of the driving sprocket 113, so that the man A, assumed to be at bat, advances past the runway inclined section 120 and stays on the lower track 119' so he is not raised into playing position above the field. The man D coming in from third base position is in his lowest or out of play position as indicated in Figs. 20 and 21, so that the pin 117 of man D engages the upper face of dropped switch arm 146 and is elevated up on to track section 119. It is to be remembered, however, that the chain is advancing the distance of two bases and a man is to be put on first base as a result of the hit. Therefore, this man D must be elevated up into playing position. It will be recalled that man A did not pass up the inclined section 120 because it had been pulled to one side by the action of the double advance magnet, but as the socket 110 carrying the man A advanced past the section 120 it engaged the tail piece 120' to put the incline 120 back into position to receive the pin 117 and elevate the next succeeding man D. So this man D, continuing from home plate on toward first base, engages the inclined section 120 and travels up on to section 121 until the first base resting position is reached.

The mechanism is now automatically stopped because it was advanced only for two bases. But still we have only one man in play, that is man D who has been stopped at first base. Thus by the control mechanism, although two men passed first base, one was eliminated and one only used. Of course, it might be that the man D at third base instead of being beneath the field at the time the double advance hit was made, was up on base as a result of prior hits. In such case the pin 117 of the man D would be resting on corner section 129 at third base, instead of being beneath the runway, so that as this man advanced toward home plate he would be up in running position and as the pin 117 passed along on top the runway R it would engage the run scoring lever 140 and then on down through the runway section 144 and over the top of switch arm 146, continuing from this point on in the manner last described, that is up section 120 and along on section 121 to first base in play above the field.

So in general it might be stated at this time that the switch arm 146 controls the oncoming men where the mechanism is operated for a two, three or four base hit, to allow all but one man to pass, putting the last one as we might say, in batting position. That is, with the pin 117 resting on the home corner section 119.

However, this control will be again referred to in connection with the power plant or driving mechanism and its cooperation with the rod 147 in controlling the switch arm 146.

#### *Motor control mechanism.*

Referring now to the motor and control mechanism as shown in Figs. 22 to 27, inclusive, this is adapted to be mounted upon the base X of the cabinet with the vertical driving shaft 155 extending upwardly as the shaft for the driving sprockets 113-114. The base Y of the control mechanism is then lined along the side of the cabinet adjacent the first base line and is secured to the base X of the cabinet.

As already stated, I preferably provide a normally inert driving motor M, that is the motor is normally inactive and is running only while men are being advanced on the bases, but it will be apparent that other arrangements may be used. This motor M is geared to the driving shaft 155 by a worm 156 and worm gear 157, the shaft 155 being driven in the direction of the arrow indicated on the gear 157.

The driving mechanism as already referred to is operated according to the hit made, that is if a one base hit is made the mechanism is operated to advance the player carrying chains the distance of one base; a two base hit advances the mechanism for

two bases; a three base hit the distance of three bases, and a four base hit or home run the distance of four bases. In order to effect this control I provide the four base hit magnets already referred to in the circuit diagram and marked in Fig. 23 to indicate the one, two, three and four base hit magnets. The operation of any one of these four magnets actuates a common rod to the motor control switch MC to start the operation of the motor and the driving mechanism, but the extent of operation is determined by the particular magnet operated. These four magnets are mounted upon a central support 158, which is rigidly pinned to the supporting stud 159, the position of said four magnets being indicated in the various figures by their designating reference characters 1BH, 2BH, etc. This is, there are four such magnets, but there are five positions or divisions of the control apparatus, the fifth position being used for effecting certain stopping control as will hereinafter be referred to. As to the common operation of the motor control switch MC, as already stated any one of the four magnets will start it but the extent of operation is determined by the particular magnet operated. I will describe the mechanism of one magnet, that is 4BH, as their construction is the same. Referring now to Fig. 25, an armature 160 is provided for the magnet, being pivoted at 161 so that when the armature is attracted the latch 162 is freed, thereby being rotated by the spring 163 on its bearing 164. This raises the inner end 165 of this latch lever, thereby raising rod 166 and thereby moving hub 167 upwardly against the tension of spring 168. This movement of hub 167 operates lever 169 to move link 170 downwardly to trip the motor switch. It will thus be seen that if any of the four hit magnets are operated this tripping rod 170 is actuated.

Now as to the mechanism controlled by this rod 170, said rod extends downwardly to a lever 171 so as to rock shaft 172 and lift the catch 173 upwardly to release the trigger 174. This trigger is under tension of spring 175 so that when released it is drawn into its dotted line or alternate position by the action of said spring 175, and while thus moving from one position to the other engages the point of the plate 176 carried by the link 177, thereby forcing this link and the lever 178 at the end of the link into its alternate or dotted line position. This permits the contact operating bell crank lever 179 to be snapped into its alternate or dotted line position by the action of spring 180, thereby interrupting the circuit for the motor through contacts 183-184. The movement of lever 179 also takes the brake shoe 185 off the brake plate 186 so that the

motor is free to rotate and start the advance of the player carrying chain.

As already stated, the extent of operation of the motor and advance of the chain is determined by the particular base hit magnet operated. This control is effected by the dropping of the roller end 187 when the armature is attracted, thereby pressing the corresponding stud 188 downwardly against the tension of spring 189, where it is locked by the pawl or lever 193 which snaps into a slot in the side of stud 188 as indicated in Fig. 24. This stud 188 has a plate 190 upon its upper end and upon which the roller 187 rides when the gear wheel 191 is rotated by the operation of the motor. This plate is long so as to fill in the space between the lever 162 and restoring cams 195 on the gear 191. Said gear 191 is in mesh with the gear 192 carried by the vertical driving shaft 155, said gears being proportioned five to one, so that for each revolution of the driving shaft 155, and which advances the chain the distance of one base, said gear 191 with its five control spaces is advanced the distance of one control space. If the chain is to be advanced the distance of two bases the control gear 191 is advanced the distance of two control spaces and the driving shaft 155 rotated two revolutions. The three and four base advances are operated accordingly.

Thus if the one base hit magnet is operated to drop its pin 188, the mechanism is advanced until this pin reaches the normal resting or control point CP, as indicated in Fig. 22. Assuming that a single base advance is to be made because of the actuation of the one base hit magnet 1BH, the motor having been started through the action of the motor control switch as already described, as the dropped pin 188 of magnet 1BH advances in the direction of the arrow indicated in Fig. 22, it engages the curved face of the switch restoring arm 194 and by the continued advance rotates this arm 194 from its full to the dotted line position.

As the pin 188 passes beyond the end of arm 194 the arm is snapped back into its full line position, but during the movement of the arm from normal to its dotted line position its downturned portion 194' engaged the trigger 174 and restored it to its normal position locked by the dog 173. However, this restoring movement of trigger 174 simply increased the tension of spring 175 without affecting the motor control switch MC which had been locked in its dotted line position by the dog 195. This dog 195 in Fig. 22 is shown in a non-locking position, but snaps into a locking position as the large gear wheel 191 started its advance when the motor started to rotate. This is brought about by the action of the pin 188 in control position CP, which in its

initial advance engaged the lever 196 to rotate it so that its connecting link 197 moved the dog 195 outwardly farther away from the locking lever 178, but as pin 188 passed beyond lever 196 it released it so that the dog 195 snapped over to lock behind the lever 178. So it will be seen that the initial movement of the large gear 191 allows this dog 195 to lock the motor control switch and therefore as the controlling pin 188 advances and operates lever 194 to restore trigger 174, it does not operate the motor control switch contacts as yet. But as the gear 191 moves the operated stud 188 to the normal or resting position CP after it has passed beyond the end of lever 194, it engages the releasing lever 196, moving it into the position indicated in Fig. 22 and thereby unlocking the pawl 195 from the switch lever 178 and permitting its restoration to its full line position of Fig. 22 to open the motor control contacts. This shuts off the motor and at the same time the brake-shoe 185 is pressed against the brake disc 186 to prevent over run of the motor.

Referring back to the operated stud 188 and its locking pawl 193, it will be noted that this stud remains locked down when it reaches and is stopped at the control position CP. However, when the large gear 191 is started for the next operation this last operated stud 188 is released to be restored upwardly out of an operating position by reason of the tail of dog 193 engaging the pin 198 in the base for the motor control mechanism. Thus the stud 188 is released and will not interfere with the proper control of the next operated stud.

Referring again to the lever 194, in addition to controlling the motor control switch this lever also controls the track or runway switch 146 of Fig. 21. This is done by means of the link rod 199 (Fig. 22), which is connected to a lever 200 carried by the rotatable shaft 201 carrying a lever 202 which connects to the link 147 running upwardly to the said track switch 146. Thus as the lever 194 is being moved from its normal or full line position to its dotted position, the rod 147 is lifted upwardly thereby allowing the tail piece 146' to move upwardly and the switch arm 146 to move downwardly in the path of the oncoming player so as to raise this player up into batting position on the home plate track section 119.

I might state at this time that by means of this lever 194 and the vertical connecting rod 147 the switch 146 is controlled to put the proper player to bat. For instance, if a one base hit is made the chain is moved only one section and therefore the first player coming along between third base and home plate is caught by the switch arm 146 and put into batting position. On a two base hit this switch catches only the second

player, because lever 194 is not operated until the large gear wheel 191 has advanced two spaces. If a three base hit is made it catches the last or third player only. Likewise, if a four base hit or home run is made it catches only the fourth or last player coming along.

The parts are so shaped and timed that the switch arm 146 is dropped when the player is between third base and home, arm 146 being maintained in this down position momentarily by the stud 188 passing over the straight portion at the end of lever 194. After the player has passed up over switch 146 onto track section 119 the stud 188 passes the end of lever 194 so that the lever snaps back into its full line position, restoring the switch 146 as the motor is shut off and comes to rest.

It will thus be seen that if the one base hit magnet is operated, the motor advances the control gear 191 one section only, that is the pin 188 at position of magnet 1BH to the normal or control position CP. Thus the chain is advanced the distance only of one base. If the two base hit magnet is operated the motor advances the control gear 191 the distance of two control spaces because the stud 188 at position of magnet 2BH is the first one coming along to encounter the control arm 194 and the switch controlling lever 196. This advances the chain the distance of two bases. Likewise, the three base hit magnet and four base hit magnet will advance the mechanism for three and four bases, respectively.

#### *Scoring mechanism.*

As shown at the rear of the cabinet in Fig. 1, I provide scoring mechanism which records the hits, runs and outs, also indicating the inning being played and which half of the inning. As already stated, my device is preferably arranged to be operated for five full innings, at which time the pitching arm is automatically disconnected and remains so until reconnected for operation by the manual setting lever for another game.

Therefore, in the scoring mechanism employed it is limited to an indication of up to five innings.

At the top and center of the score board are three windows 205, 206 and 207. The registers back of the upper two windows 205 and 206 indicate whether it is the first half or the last half and the particular inning being played. As shown in Fig. 1 the score board indicates the first half of the first inning is being played and there are no outs. When three outs are made the figure 1 appearing in window 205 is changed to a blank and a figure 1 appears in window 206 to indicate that it is the last half of the first inning. As the game proceeds the proper numbers are indicated.

The score board also contains mechanism for recording the hits and runs for each side. The registers back of the two windows at the left of the score board record the hits and runs for one side or player, and the two windows at the right indicate or record the hits and runs for the other or opposing side or player.

When the five complete innings have been played the score board retains the score in hits and runs until the next game is started, when the recorded hits and runs are automatically erased. That is the recording mechanism is restored to normal or zero.

Referring now more in detail to this scoring and recording apparatus and which is shown in Figs. 11 to 15, inclusive, I provide recording drums comprising the inning and out recording drum 208 which is positioned back of the three windows 205, 206 and 207. The upper row of numerals records when the first half of any inning is being played, and the second or intermediate row indicates when the second half of any inning is being played. For example, as the drum stands in Fig. 11 it indicates the first half of the first inning and the third row of numerals indicates no out. When the first out is made this drum is rotated from right to left, that is clockwise, and would record one out. This moves the second numeral 1 of the upper row of figures before window 205, still indicating the first half of the first inning but one out. When the second out is made the drum is moved another step, indicating two outs with the first half of the first inning. When the third out is made the drum is moved another step and now the upper window 205 is blank, but the numeral 1 appears in window 206, thus indicating the second half of the first inning with no outs. Thus as successive outs are made the drum is advanced, always indicating the inning and the number of outs. Thus the players or operators know just how the game is advancing.

Now as to the hits and runs, as previously stated these are recorded for each player or each side. Drum 209 records the hits and drum 210 the runs for one player or side, and drums 211 and 212 the hits and runs respectively for the other side.

The five drums referred to are mounted upon their respective shafts, the four hit and run shafts being spring returned, each by a spring as 213. That is, at the end of each game, or rather at the beginning of any game, the drums are restored to normal.

Considering first the operation of the inning and out recording drum 208, this drum is advanced one step each time an out is made and to this end I use a spring driven ratchet wheel 214 securely fastened to the lower end of shaft 215, one end of a driving spring 216 being fastened to the main shaft 215 and the other end of the spring to the drum 217

carrying a spring winding ratchet wheel 218. The ratchet or escapement wheel 214 is permitted to be driven forward by the action of an escapement pallet 219 which is connected by a link 220 to the armature 221 of the out magnet O. That is, each time the out magnet O is energized in response to the closure of a pair of out contacts, the armature 221 is attracted to reciprocate the escapement pallet 219, thereby permitting the advance of one tooth of ratchet wheel 214. This ratchet wheel is divided into thirty spaces or thirty teeth, corresponding to the thirty divisions of the inning and out recording drum 208 which moves in one direction only.

The out magnet O operates a circuit breaker to open its own circuit momentarily each time it is energized to prevent double or false operations such as might occur from having the hit ball chatter on its contacts. To this end (Fig. 12) a metal ball O' is mounted on an inclined runway O<sup>2</sup>, but normally resting against contacts O<sup>3</sup> in the circuit of magnet O. This ball O' is hit by the hammer O<sup>4</sup> when the armature 221 of magnet O is attracted, knocking the ball up the inclined runway to open the circuit across the contacts O<sup>3</sup> and interrupting the circuit of the magnet long enough for the hit ball 102 to drop off the out contacts.

The said driving spring 216 for the out shaft and drum is wound up by the operation of the pitching arm through the action of a pawl 222 (Fig. 14), which is in the form of a rod extending back to the bell crank lever 223 connected by a link 224 to the crank shaft 65. Thus for each rotation of the pitching shaft 42 the bell crank 223 is reciprocated, thereby giving a reciprocation to the rod 222 terminating in the pawl and thus the spring winding ratchet wheel 218 carried with the spring drum 217 is advanced one tooth for each pitching operation. In order to prevent overwinding the spring, this winding operation is effected only by the first twenty-nine balls pitched, that is the first twenty-nine pitching operations. The out scoring drum is advanced one complete rotation or thirty steps only for each five innings played. Therefore the spring need only be wound one revolution for each game, and as I preferably do this automatically with the pitching arm, and as there usually are a great many more than twenty-nine balls pitched in a game, I use only the first twenty-nine pitching strokes. It will be noted there are thirty teeth in the winding ratchet 218, but normally the pawl 222 rests in a dead or vacant upper half of tooth 230. To put the gear in winding relation it is advanced one tooth by the pawl 225, which is in the form of a rod connected back to the manually operated setting lever and is operated when the setting lever is initially actuated to start a game. This

connection extends back by rod of pawl 225 to the upper arm 226 (Fig. 4) of a bell crank lever, the other arm 227 of which is connected by rod 228 to the left arm 229 (Fig. 3) of the setting lever. Thus as the arm 54 of the setting lever is pulled over toward the right and then back again to set the mechanism by operating the pitching arm clutch, winding ratchet 228 is advanced one step by the pawl 225 so as to place the first active tooth in the path of pawl 222. Thereafter upon the first twenty-nine operations of pawl 222 responsive to the first twenty-nine pitching operations, ratchet 218 is advanced until the normal or dead tooth 230 comes around and after that the reciprocations of pawl 222 are ineffective. A holding dog 231 is provided for holding the ratchet wheel 218 as it is advanced.

Coming back to the operation of the out and inning registering shaft 215, upon each three steps of this shaft, that is upon the recording of each third out and which is the end of each half of each inning, any players remaining on the bases above the field in playing position are dropped out of playing position as already stated. This is brought about by the teeth 232 mounted beneath the escapement wheel 214 (Fig. 11), there being ten such teeth 232, each one equalling three steps of the escapement wheel 214. Riding on these teeth is a roller 233 carried by the arm of a bell crank lever, the other arm of which has attached thereto a rod 234 (Fig. 13) extending back to a tripping mechanism which operates the rod 138 extending to (Fig. 19) the connections for pulling out the corner sections which drop the men out of play. This tripping mechanism includes an upright lever 235 having a tooth 236 adapted to be engaged by the tooth 237 on rod 234, that is as the rod 234 is advanced by the action of a tooth 232 the tooth 237 drops over tooth 236. Then as the roller 233 reaches the end of a tooth 232 it snaps over the end of the tooth, thereby pulling rod 234 to the left and due to the engagement between 236 and 237 the arm 235 is rocked toward the left. This pulls the rod connection 138 toward the left, pulling out the corner sections to release the players. In order to disengage teeth 236 and 237 during the last said operation, so as to allow the arm 235 and corner sections to restore, the upper right corner 235' of arm 235 engages the underneath side 237' of the end of 237 as arm 235 moves toward the left, lifting the tooth 237 free of tooth 236 so as to allow the arm 235 to restore to its position as shown in Fig. 13. It is now ready for the next operation.

It will be noted, referring to Fig. 13, that the arm 238 controlled by the roller 233 has an upper extension for controlling score shifting mechanism, but this will be de-

scribed later in connection with the hit and run scoring apparatus.

Referring again to Fig. 11 and to the mechanism shown at the bottom of the sheet, I provide a device which is adapted to be actuated at the end of the game, that is the full five innings, to disconnect the pitching shaft until another coin is deposited and the manual lever operated as already referred to. To this end I provide the bell crank lever 240 carrying a roller on its horizontal arm cooperative with the cam 241 carried on the upper surface of the escapement wheel 214. This cam 241 makes one revolution the same as the out and inning scoring drum 208 on the shaft 215, for each full game so that as the cam 241 is rotated it lifts the horizontal arm of the bell crank lever 240, thereby rotating the vertical arm to the left and operating rod 57 accordingly. Thus on the advance movement of this rod 57 it snaps over the tail 55' of the retaining pawl 55 (Fig. 9) so that as the roller snaps over the end of cam 241 the bell crank 240 is moved back by the action of spring 242 to actuate the rod 57 and withdraw pawl 55 to operate the clutch and disconnect the pitching arm.

In Fig. 11 I also show a bell 243 which is rung on the third out at the end of each inning half, so as to indicate audibly to the players that the half inning is ended. This bell 243 is operated by a clapper 244 connected by a rod 245 to the lever 246 carrying a roller shown in dotted lines in Fig. 14, which rides upon the teeth 232. It will be remembered that there are ten such teeth 232 and so each tooth effects an operation of the bell for each three outs, the roller of lever 246 being positioned so that the bell is rung upon each third out.

Referring now to the hit and run scoring apparatus which includes the four drums 209 to 212, each one of these drums has like advancing mechanism and I will describe one only. Referring therefore to the hit recording drum 209, it is mounted upon a suitable shaft 247 having the restoring spring 213 wound thereon and said shaft having a driving ratchet 248 mounted at the lower end thereof. A check pawl 249 retains the ratchet in its advanced position and a pivoted stop 250 is provided which permits a continued rotation or advance of the scoring drum over more than a single revolution. It will be noted this drum will score up to twenty-four hits, but if more than twenty-four hits are made by this particular side in a single game the drum may continue its rotation in the direction of the arrow indicated on the ratchet wheel 248, so that the stop pin 251 will pass the stop arm 250 in its advance. However, larger drums for a greater number of runs and hits may be used and which will advance a single revolution only.

For advancing the ratchet wheel, each one

is provided with an operating pawl like 252, these being actuated from the proper hit or run lever when the players are advanced around the bases and as will be more fully described.

Returning to the retaining pawl 249, the four pawls are adapted to be actuated to release the four scoring drums for each game, and to this end I provide a common sliding bar 253 shown by dotted lines in Fig. 12 and carrying pins 254, one for each pawl 249. A lever 255 is connected to the end of bar 253 and is actuated by the rod 256. That is, as the rod 256 is drawn forwardly, the lever 255 moves bar 253 toward the left so that each pin 254 engages its corresponding check pawl 249 to disengage it from the tooth of ratchet wheel 248, so that the hit and run scoring drums are restored. I might state at this time that the operating rod 256 is pulled at the beginning of each game when the setting lever is moved. In this way the score remains on the score board at the end of the game, so that the players have time to see and consider it between the end of the game and the beginning of the next. This operating rod 256 extends on into Fig. 4, where it is connected to an arm 257 which is operated to pull the rod 256 each time the lever 226 is operated by the rod 228 extending up to the setting lever 54.

Referring now to the hit and run scoring drums, as previously stated there is one of each of such drums for each side. That is, drums 209 and 210 are for one side and drums 211 and 212 for the other side. These drums are operated by the hit and run scoring levers as the men are advanced around the bases. That is (Fig. 19) by the hit lever 123 and the run lever 140. Whenever the hit lever 123 is actuated it operates a hit registering plunger 259 (Fig. 12) through the medium of a connecting link 260 (Fig. 19) extending from hit scoring lever 123 back to bell crank lever 261 and by means of another link 262 back to bell crank lever 263 to plunger 259. Thus for each actuation of the hit lever by a runner being advanced to first base or beyond, the hit scoring plunger 259 is actuated. This results in the advance of a hit recording drum, as will be described.

Whenever the run scoring lever 140 (Fig. 19) is operated by a man passing from third base to home, the run scoring plunger 143 (Figs. 19 and 12) is operated to actuate a run scoring drum.

In order to determine which set of hit and run scoring drums is to be operated by the single pair of hit and run plungers 259—143, I provide so-called discriminating or shifting apparatus adapted to shift the hit and run plungers and position them to operate the proper drums.

As previously stated, each scoring drum is actuated by a pawl 252 (Fig. 12) extend-

ing back to a rod 264 slidingly mounted in the supports 265. Thus when the hit plunger 259 is actuated it engages the rod 264 or 264' (according to the side at bat) and advances this rod to actuate corresponding pawl 252 and rotate corresponding drum 248 one tooth. Likewise, when the run scoring plunger 143 is actuated it engages plunger 266 or 266' and actuates the corresponding pawl to advance the run scoring drum 248'. The common hit and run plungers 259—143 remain positioned before one set of individual hit and run plungers 264—266 until the first half of the inning is played. That is, until three outs are made. Then the hit and run plungers 259—143 are shifted to the individual hit and run plungers 264'—266' for the hit and run scoring apparatus of the other side. This is brought about by the shifting of the pivoted arm 267 (Fig. 12) and which arm carries an upright extension 268 (Fig. 13) in which the hit and run plungers are slidingly supported. This shifting arm 267 is carried by a shaft 269 pivotally supported at its ends and carrying a central offset portion 270 having a spring 271 attached thereto, said spring being adapted to snap the shifting mechanism from one position to the other and maintain it there. This is brought about upon each third out, that is at the end of each half inning, by the actuation of the lever 238 (Fig. 13) which it will be remembered gradually rides up on a tooth 232 and snaps down into the hollow when each third out is scored. The upper arm of this lever 238 carries a rod extension 272 having a forked end 273 (Fig. 15) straddling the lower end of shaft 269. Carried by the shaft 269 adjacent the forked ends are pin carrying arms 274—275 adapted to be engaged by the teeth 276—277 of the operating fork to shift the crank shaft 269 from one position to the other. This shaft 269 also carries an arm and down extension 278 at its lower end, in which a leaf spring 279 is slidingly supported, this spring extending back and being rigidly connected to the operating rod 272 so as to shift the fork 273 laterally from one position to the other so as to bring the proper teeth 274—276, 275—277 into cooperation.

Thus with the shifting mechanism in the position indicated in Figs. 12, 13 and 15, and assuming that it is to be shifted into its alternate position, as rod 272 is being drawn rearwardly by the riding of roller 233 on a tooth, the left arm of fork 273 is drawn backwardly until the tooth 276 snaps back of pin 274. This is brought about by the flat spring 279 pressing the fork 273 toward pin 274. At the end of this rearward travel the roller 233 then snaps over the end of tooth 232, thereby moving rod 272 and the fork 273 forwardly so that tooth 276 pushes

against the pin 274, rotating shaft 269 and thereby shifting the plunger arm 267 from its left to its right position and putting the plungers 259—143 in operative relation before plungers 264'—266'. In the said shifting movement of shaft 269 the initial or first half of the movement is against the tension of spring 271 (Fig. 13), but as soon as arm 270 to which spring 271 is attached passes the central or neutral point, this spring 271 snaps the shaft and its parts into alternate position which is opposite to that shown in Fig. 15. This shifting movement of shaft 269 also throws the arm 278 from its left to its right position, thereby carrying the flat spring 279 from its left to its right position. This shifts the fork 273 laterally to press the arm carrying tooth 277 against pin 275 so that the next movement of rod 272, which is at the end of the second half of the inning, will shift the crank shaft 269 and the scoring plungers 259—143 back to their first position.

Thus at the end of each half inning the scoring mechanism is altered so that the proper drums or dials are actuated to score the runs and hits for the side at bat.

#### Operation.

Having described in detail the construction of the various units and the operation of the various units together with the cooperation between the parts, and having described detailed portions of some of the plays, I will now describe in general various plays, although not all possible plays. There are an almost unlimited number of possible plays, but from those I will now describe, various others will readily be understood.

We will assume now that the apparatus is all at normal. The setting knob 64 is first pulled out and pushed back, thereby connecting the pitching crank P into cooperative relation with the pitching mechanism. The scoring mechanism is thereby placed at normal with the apparatus indicating the first half of the first inning and no outs. The first player now takes his position with the left hand grasping the pitching crank P and the right hand grasping the batting knob B. In Fig. 1 a runner is shown at second base, but this is for illustration only as at the beginning of the game there are no runners above the field.

The operator now gives a single rotation to the pitching crank P in the direction of the arrow indicated thereat in Fig. 1, thereby operating the pitching arm to throw a ball out of the pitching box PB toward the home plate. This ball travels at a speed which permits the player to manipulate the bat 30 by the batting knob B to swing the bat back and then forward as in a regular game to hit the ball. The ball used, as al-

ready stated, is preferably a metallic ball and I use a steel bearing ball  $\frac{3}{4}$  of an inch in diameter in the apparatus now employed. This ball may be hit in any direction over the field, and when an operator or player becomes skilled in the manipulation of the apparatus the ball may be very nicely controlled for direction.

Now as to some of the possible plays, and which will be described, there is a one base hit, that is in which the batter is advanced to first base and any players on the bases are each advanced one base. A two base hit, in which the batter is advanced to second base and any players on base advanced two bases. Of course, should there be a man on third base he is advanced to the home plate, scoring, a run on the way, but he drops out of play in reaching home plate and then continues on to first base beneath the field without showing. In a like manner three and four base hits may be made and runners on base advanced accordingly. Also an out may be made, by knocking the ball to certain predetermined points in the field, and as previously stated, these points correspond substantially to points on a regular diamond which when reached would ordinarily result in an out. Also an out may be made by a strike. In the preferred form of my mechanism, should the batter fail to hit the ball and it goes on through into the strike-out opening SO, a single strike results in an out. Then there is the sacrifice hit. That is, in which the batter is put out and an out registered on the scoring apparatus but the men on base are advanced one base. That is, a man on first would be advanced to second, a man on second to third, and a man on third to home plate, scoring a run. Also there is what I call a two base advance hit. That is, in which the batter makes a base hit and is advanced to first base only, while any men on base are advanced two bases. This is a play which frequently takes place in a regular game.

Taking up first a one base hit, that is in which the ball drops into a pocket and closes circuit through a pair of contacts 1C. The one base hit magnet 1BH is thereby energized, releasing the motor control switch MC which opens the circuit for the batting magnet to prevent unwitting repetition thereof, and closes circuit for the motor, starting the advance of the chains and moving man A at the home plate to first base. On the way to first base the pin 117 of this man in traveling along the track R engages and operates the hit scoring lever 123, thereby advancing the hit register 209 one point to register the first hit. When the man reaches first base the motor is automatically stopped by the stud 188 of the setting apparatus actuated by the magnet 1BH, so that as this stud reaches the control position CP, it restores

the motor control switch MC interrupting the motor circuit and placing a brake on the motor so as to stop it immediately.

Assuming that the next hit results in an out, that is in which the ball is dropped onto out contacts OC, the out magnet O is operated, thereby rotating the out and inning registering drum a single step to score the first out, which appears before window 207. The operation of this out magnet O operates its circuit breaker O' so that its circuit is broken after the first energization and remains open long enough to prevent an undesirable re-energization, for instance by the chattering of the ball on the contacts.

Assuming that the next ball hit results in a three base hit by dropping onto a pair of contacts 3C, the three base hit magnet 3BH is energized, thereby operating the motor control switch to close the motor circuit and advance the player carrying chain the distance of three bases.

It will be remembered that when this three base hit was made the man A was on first base. Therefore, with the chain advanced three bases as a result of the three base hit, the man A is brought from first base all the way around to home plate. As this man A advances from third base to home, the pin 117 running along on the track R engages the run scoring lever 140 (Fig. 19), thereby operating the run scoring drum 210 to register 1, that is the first run. At the same time the man D, who was at home plate and was supposed to be the batter, is advanced along the runway R and in passing to first base operates the hit scoring lever 123 to register the second hit for this side, which I will refer to as the first side. This man D, however, continues around to third base, having made a three base hit. Thus the chain having been advanced three bases, three men pass the home plate position but only one of them must be brought up onto the runway section 119 in batting position, for if they were all brought up there the first two of these three men would continue on the runway R past the hit scoring lever 123. So to prevent this, the switch arm 146 (Fig. 21) is kept in its full line position and draws the first two men down beneath the switch, and in this way beneath the corner section 119. However, when the third man comes along this switch 146 is dropped, so as to allow the pin 117 to ride on top the arm then up onto section 119 into batting position. This is controlled from the power plant, as previously described. That is, the apparatus is so arranged that when more than a one base hit is made, which means that a corresponding number of men are advanced toward home plate, only the last man is picked up by the switch 146 and put to bat. In other words, when the last man of the series is advancing between third base

and home, the switch arm 146 is dropped to pick up this man and put him to bat. Thus on a one base hit it catches the first man. On a two base hit, the second man. On a three base hit, the third man, and on a four base hit or home run, the fourth man.

Thus as described, the man on first base was advanced to home plate by the three base hit and the man D at bat when the three base hit was made was advanced to third base, where he now rests. We thus have man A back at home plate in batting position and man D at third base and one out.

Assuming the next ball pitched is a strike, that is the batter fails to touch the ball with the bat 30, the ball will roll on into the pocket back of home plate and close the strike-out contacts SO, thereby again operating the out magnet O and registering the second out.

Assuming that a one base hit is next made, this results in the advance of the batter A to first base, thereby operating the hit lever 123 and scoring a hit, and also advances the runner D at third base to home plate, passing the run lever 140 and scoring a run. This man D in advancing to home plate passes on top of the runway 119 at home plate to be put into batting position, because the switch arm 146 was dropped.

We now have the man A at first base and the man D at bat, with two out.

Assuming that the next hit results in a double advance, that is a hit which puts the batter on first base but advances any men on base the distance of two bases. As already stated, this is a play which frequently occurs in a regular game. Therefore, when the ball is hit and drops across a pair of double advance contacts DAC, magnet DA is energized. Inasmuch as the man A at first base is to be advanced two bases as a result of this hit, it means that the chain must be advanced two bases. But a batter is to be put at first base only. That is the batter has made a single. Therefore, the closing of contacts 152-153 of magnet DA energizes the two base hit magnet 2BH, causing an operation of the motor to advance the chain two bases. The operation of magnet DA also pulls the link 150 (Figs. 19-20), thereby opening the runway switch 120 and also dropping the runway switch 146. As a result, the player D in batting position at the home plate at the time the hit was made, instead of passing up the runway section 120, passes on over the straight section 119' and as it passes the tail piece 120' restores the switch section 120 to catch the next man and put him up on the field at first base. This next man is the one that is coming in from the third base position, but this man is not up in play, that is he is down below the field as indicated at D in Fig. 21. So as

this man advances toward the home plate he is picked up by the dropped switch arm 146, and advances up onto the home plate section 119. But it is to be remembered that the chain is advancing two bases and this man coming from third is therefore the one that is to be put on first base. Therefore, as the chain continues the advance, this man is carried up the runway section 120 and on past the hit scoring lever 123 and stopped at first base.

It will thus be seen that as a result of the double advance hit, although the chain was advanced two bases and thereby carried the man who was at first base around to third base, only one man was put up on first base as a result of the hit because of the action of the switch arms 120 and 146.

We now have a man at first base and one at third with two out.

Assuming that the next ball hit drops across a pair of out contacts OC, the out magnet O is energized rotating the out drum another step, that is its third step, bringing the figure 1 before the window 206 and indicating this as the second half of the first inning. That is the second side is now to bat. Also the figure 0 appears before window 207, indicating that there are no outs. This third step of this drum also rings the bell to indicate the third out. Likewise the men on bases must be taken out of play and therefore the corner sections at the bases are all pulled out by the action of a ratchet tooth 232 at the bottom of Fig. 11, thereby dropping the men as stated so that the field is clear. Likewise, this ratchet tooth 232 in operating the roller 233 actuates the shifting mechanism (Figs. 12-15) to shift the scoring plungers 143-259 to their alternate position so that the hits and runs scored by the second side are properly recorded on the scoring drums 211-212.

We are now starting the second half of the first inning with no outs and no men on base. Assuming the first ball hit is for two bases, this places the batter on second base. Assuming that the next ball hit is a sacrifice hit, this results in the energization of the sacrifice hit magnet SH. Therefore, its contacts are closed, energizing the one base hit magnet 1BH to advance the runner on second base to third base. The batter, however, is put out as in a regular play and therefore the out magnet O is energized by the closing of the contacts of magnet SH. The operation of magnet O scores an out on the recording drum, moving the figure 1 in front of window 207. It will be remembered that the chain was advanced one base as a result of the energization of magnet 1BH, but the batter coming from home plate is dropped out of play because he was put out. That is, when the sacrifice hit mag-

net SH was energized (Fig. 20), it pulled the rod 126 to open the track switch section 124, thereby dropping the advancing runner out of play before reaching first base. This switch section 124 is restored however, by the advancing player due to the engagement of the tail piece 124' as the player passes along.

We now have a man at third base and one out, the man at second having been advanced to third as a result of the sacrifice hit.

Assuming the next ball hit results in an out, this is the second out and is recorded by the out scoring drum. Therefore we still have the man at third base, with two outs.

Assuming now that the next ball hit drops onto a pair of sacrifice hit contacts. Of course, in a regular game with two out and with a man on third, there is no such thing as a sacrifice hit, because if the batter is put out on the play before the runner reaches home plate the runner does not score. But in this apparatus the ball may drop onto a sacrifice hit contact at any time. So that under the present circumstances, although as a result of the ball dropping on the sacrifice hit contacts the sacrifice hit magnet is operated in the regular way and the chain advanced for one base, I put all players on base (in the present case we have a man at third base) out of play at once. This is brought about by the operation of the out magnet as a result of the closing of the contacts on the magnet SH, thereby moving the drum to the third out. Therefore, a tooth 232 carried with the drum shaft (Fig. 13) operates the link 234 so as to pull out the corner sections of the runway. The man at third base immediately drops out of play by the withdrawal of corner section 129. Therefore, although he continues on toward home plate by reason of the continued advance of the chain, the pin 117 has dropped beneath the runway R so that it cannot operate the run scoring lever 140. As this man advanced toward home plate, however, he is put up into batting position because switch arm 146 was dropped as a result of the operation of rod 147 from the motor control apparatus. The batter that was advancing from the home plate to first base as a result of the sacrifice hit is also put out of play before he can operate the hit scoring lever 123, because the track switch 124 at first base was moved into its dotted line position by the operation of the sacrifice hit magnet.

So three outs having been made for the second half of the first inning, the bases are cleared and the apparatus is ready to start the first half of the second inning.

With the plays already described it is thought that the various possible combina-

tions may be readily understood without going into the lengthy explanation necessary to detail such plays.

tracting the pitching arm for a successive pitching operation.

5 I might state, however, that the play would continue through the five full innings, during which time the hits and runs for each side would be registered and show on the score board. Also when the last out of the fifth inning was registered the pitching arm is automatically disconnected, as has already been described, so that before the apparatus can be used for further play the manually operated setting arm must again be actuated.

6. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, a playing ball and means for receiving the same in the pitching arm, means for manipulating the pitching arm to raise it above the surface of the field by a pitching movement to pitch the ball by rolling it along the surface of the field, a door flush with the surface of the playing field to cover the pitching arm in its normal position and means for raising and restoring the door for each pitching operation of the pitching arm, whereby the surface of the playing field is unbroken except during the pitching operation.

15 What I claim as new and desire to secure by United States Letters Patent is:

7. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, a playing ball and means for automatically feeding the same in the pitching arm, and means for manipulating the pitching arm to raise it above the surface of the field by a pitching movement to pitch the ball by rolling it along the surface of the field, said latter means comprising a manually set spring actuated tripped mechanism for actuating the pitching arm.

1. In an automatic base ball game, a playing field, a vertical shaft extending up through the field at the home plate, a bat fixed to the shaft and positioned close to the field so as to meet the ball when rolled toward the bat on the field, a manually rotatable handle, and connections extending from the handle to the batting shaft to reciprocate the latter so as to swing the bat responsive to rotation of the batting handle.

2. In an automatic base ball game, a playing field, a vertical shaft extending up through the field, a bat fixed to the shaft above but close to the field so as to meet a ball when rolled toward the bat on the field, a manually rotatable batting handle, and a resiliently yielding connection between the handle and shaft so as to reciprocate the latter by a springy action responsive to rotation of the batting handle.

3. In an automatic base ball game, a playing field, a metallic base ball, a solid metallic bat rotatably mounted close to the playing field so as to be swung in a circle for batting, and means for pitching the ball by rolling it along on the surface of the field to be hit by the bat, and automatic means for feeding the ball to the pitching means.

4. In an automatic base ball game, a playing field, a metallic base ball, a solid metallic bat rotatably mounted close to the playing field so as to be swung in a circle for batting, means for pitching the ball by rolling it along on the surface of the field to be hit by the bat, and control contacts distributed around the playing field adapted to be engaged by the ball when hit, and means for automatically returning a hit ball to the pitching means.

5. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, a playing ball and means for receiving the same in the pitching arm, and means for manipulating the pitching arm to raise it above the surface of the field by a pitching movement to pitch the ball by rolling it along the surface of the field, and thereafter automatically re-

8. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, a playing ball and means for automatically feeding the same in the pitching arm, manually controlled means for manipulating the pitching arm to raise it above the surface of the field by a pitching movement to pitch the ball by rolling it along the surface of the field, said latter means including spring actuated mechanism for effecting a like speed of the pitching arm and pitched ball for each operation independent of variance by the operator during the pitching operation.

9. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, a playing ball and means for automatically feeding the same in the pitching arm, manually controlled means for manipulating the pitching arm to raise it above the surface of the field by a pitching movement to pitch the ball by rolling it along the surface of the field, said latter means including spring actuated mechanism for effecting a like speed of the pitching arm and pitched ball for each operation independent of variance by the operator during the pitching operation, and means adapted to be operated by an opponent for varying the speed of the pitching arm and pitched ball unknown to the operator.

10. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, a playing ball and means for receiving the same in the

- pitching arm, a trapdoor above the pitching arm flush with the surface of the playing field to cover the pitching arm in its normal position beneath the field, a manually operated bat for hitting the ball when pitched, mechanism for operating the pitching arm to raise it above the surface of the field by a pitching movement to pitch the ball toward the bat by rolling it along the surface of the field, and means for raising the door responsive to a pitching movement of the pitching arm and restoring the door before the ball can be hit by the bat and knocked out on the field over the trapdoor.
11. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, a playing ball and means for automatically feeding the same in the pitching arm, mechanism for operating the pitching arm to raise it above the surface of the field by a pitching movement to pitch the ball by rolling it along the surface of the field, and a manually operable member for controlling said mechanism to operate the pitching arm.
12. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, a playing ball and means for receiving the same in the pitching arm, mechanism for operating the pitching arm to raise it above the surface of the field by a pitching movement to pitch the ball by rolling it along the surface of the field, a manually operable member for controlling said mechanism to operate the pitching arm, and means for rendering said manually operable member inoperative responsive to a predetermined number of particular plays.
13. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, a playing ball and means for receiving the same in the pitching arm, mechanism for operating the pitching arm to raise it above the surface of the field by a pitching movement to pitch the ball by rolling it along the surface of the field, a manually operable member for controlling said mechanism to operate the pitching arm, means for registering outs responsive to certain travels of pitched balls when hit and mechanism for rendering the manual member inoperative responsive to a predetermined number of outs.
14. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, mechanism including a manually operated member for actuating the pitching arm to pitch a ball fed thereto by rolling it along the surface of the field, a plurality of playing balls, openings disposed around the field through which the ball drops after being pitched, a feeding runway positioned beneath the playing field for receiving the balls when dropping through said openings, and means responsive to each actuation of the manual member in operating the pitching arm to feed a ball from the feeding runway to the pitching arm.
15. In an automatic base ball game, a playing field, a pitching arm positioned beneath the surface of the playing field, mechanism including a manually operated member for actuating the pitching arm to pitch a ball fed thereto by rolling it along the surface of the field, a plurality of playing balls, openings disposed around the field through which the ball drops after being pitched, a feeding runway positioned beneath the playing field for receiving the balls when dropping through said openings, and means responsive to each actuation of the manual member in operating the pitching arm to feed a ball from the feeding runway to the pitching arm, said last means including mechanism to prevent feeding more than one ball for each actuation of the pitching arm.
16. In an automatic base ball game, a pitching arm pivoted at its forward end and having a ball receiving pocket at its rear end whereby said arm may be swung upwardly through a vertical plane to pitch a ball forwardly from the pocket, a vertically disposed ball feeding tubular member having an open upper end disposed adjacent the pitching arm, a plurality of balls in said tubular member, a manually operable member for actuating said pitching arm to pitch a ball, and means responsive to each actuation of said manual member to feed a ball from the tubular member into the ball receiving pocket of the pitching arm.
17. In an automatic base ball game, a vertically disposed ball feeding tubular member, a plurality of balls successively disposed within said tubular member, a horizontally disposed pitching arm pivotally supported at its forward end adjacent an opening at the top of said tube and having a ball receiving pocket at the rear end of the arm, a manually operable member, means for actuating said pitching arm to pitch a ball out of its pocket responsive to each actuation of the manual member, and mechanism responsive to each pitching actuation of the manual member for lifting the balls in the tubular member with the uppermost one thereby raised above the pitching arm whereby it is fed back into the pocket.
18. In an automatic base ball game, a vertically disposed ball feeding tubular member, a plurality of balls successively disposed within said tubular member, a horizontally disposed pitching arm pivotally supported at its forward end adjacent an opening at the top of said tube and having a ball receiving pocket at the rear end of the arm, a manually operable member, means for ac-

tuating said pitching arm to pitch a ball out of its pocket responsive to each actuation of the manual member, mechanism responsive to each pitching actuation of the manual member for lifting the balls in the tubular member with the uppermost one thereby raised above the pitching arm whereby it is fed back into the pocket, a hopper and runway for receiving the balls after being pitched and extending down to the lower end of the tubular member, and means for feeding a ball from said runway into the tubular member beneath the lowermost ball therein responsive to each feeding operation of the balls in the tubular member.

19. In an automatic base ball game, a playing field, a pivotally mounted pitching arm positioned beneath the surface of the playing field, a manually reciprocable lever (68), spring retracted mechanism wound against the tension of its retracting spring responsive to actuation of the manual lever, means for automatically tripping said mechanism upon completion of its winding movement whereby it is spring restored, and a connection from said mechanism to the pitching arm to effect a pitching operation thereof when said mechanism is tripped and restored.

20. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means for operating said mechanism to advance the players responsive to a hit ball.

21. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, means for operating said mechanism to advance the players responsive to a hit ball, and control apparatus for varying the extent of operation of said mechanism to advance the players one or more bases according to where the ball is hit to.

22. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means for operating said mechanism to advance a player one base responsive to a hit ball.

23. In an automatic base ball game, a

playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means for operating said mechanism to advance a player two bases responsive to a hit ball.

24. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means for operating said mechanism to advance a player three bases responsive to a hit ball.

25. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means for operating said mechanism to advance a player four bases responsive to a hit ball.

26. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means for operating said mechanism to advance a player from one to four bases responsive to a hit ball depending upon where the ball is hit to.

27. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, means for operating said mechanism to advance a player from home plate to first base responsive to a hit ball, and means for advancing the player at first base to a subsequent base and another player from home plate to first base responsive to another hit ball.

28. In an automatic base ball game, a playing field, a playing ball pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, means for operating said mechanism to advance a player from home plate to one of the bases responsive to a hit

ball, means for advancing another player from home plate to a base responsive to another hit ball, and means for advancing the first player a number of bases corresponding to the advance of the second player.

29. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means for operating said mechanism to advance the players successively and progressively responsive to successive hit balls.

30. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for placing a player at any of the bases, and means for operating said mechanism to place a player at a base responsive to a hit ball.

31. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding the playing ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for placing a player at first, second, third base or home, and means for operating said mechanism to place a player at one of said four bases responsive to a hit ball and depending upon where it is hit to.

32. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, control means responsive to a hit ball for operating said mechanism to advance a batting player from home plate to one of the bases, and sacrifice hit apparatus responsive to a hit ball for operating said mechanism to advance the player on base and advance a player from home plate toward first base but take said latter player out of play before reaching first base.

33. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, control means responsive to successive hit balls for operating said mechanism to advance successive batters from home plate progressively to the bases, and sacrifice hit apparatus responsive to a hit ball for operating said mechanism to ad-

vance the players on bases and advance a player from home plate toward first base but take said latter player out of play before reaching first base.

34. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, control means responsive to a hit ball for operating said mechanism for advancing a player from home plate to first base, and double advance apparatus responsive to another hit ball for operating said mechanism to advance a player from home plate to first base and advance the player on first base to third base.

35. In an automatic base ball game, a playing field a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, control means responsive to a hit ball for operating said mechanism to advance a batting player from home plate to one of the bases, and double advance apparatus responsive to another hit ball for operating said mechanism to advance another batting player from home plate to first base and advance the player already on base the distance of two bases.

36. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, control means responsive to successive hit balls for successively and progressively advancing men along the bases corresponding to the number of balls hit, and double advance apparatus responsive to another hit ball for advancing the players already on base each the distance of two bases and advancing another player from home plate to first base.

37. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and one, two, three and four base hit apparatus and sacrifice hit apparatus each independently operable responsive to a hit ball for operating said mechanism to advance the players accordingly.

38. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and one, two, three and four base control means indiscriminately successively operable responsive to successive hit balls for oper-

ating said mechanism to correspondingly advance players on the bases.

39. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, control positions on said field each having a control element responsive to engagement by a hit ball, and means for operating said mechanism to advance the players according to the element engaged by the hit ball.

40. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, one, two, three and four base hit control positions on said field each having a control element responsive to engagement therewith by a hit ball, and means for operating said mechanism to advance the players according to the control element engaged.

41. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, out and hit control positions distributed around the field each having a control element responsive to engagement with a hit ball, and means whereby said mechanism is or is not operated to advance a player according to whether an out or hit element is engaged.

42. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, means responsive to a hit ball for operating said mechanism to advance a player accordingly, out mechanism responsive to a pitched ball for indicating an out, and means for taking the man on base out of play by removal from the field responsive to a predetermined number of operations of the out indicating mechanism.

43. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, means responsive to successive hit

balls for operating said mechanism to successively and progressively advance players on the bases corresponding to the balls hit, out indicating apparatus responsive to pitched balls for indicating outs, and means for taking the men on base out of play by removal from the field responsive to a predetermined number of operations of the out indicating apparatus.

44. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means for operating said mechanism to advance the players responsive to a hit ball, said means including control electromagnets and control contacts therefor distributed around the field for engagement by a hit ball.

45. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, means for operating said mechanism to advance the players responsive to a hit ball, and control apparatus for varying the extent of operation of said mechanism to advance the players one or more bases according to where the ball is hit to, said control apparatus including control magnets and electrical contacts therefor distributed around the field for engagement by a hit ball.

46. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means including control magnets and electrical contacts therefor distributed around the field for engagement by a hit ball for operating said mechanism to advance a player from home plate to first base responsive to a hit ball.

47. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means including control magnets and electrical contacts therefor distributed around the field and adapted for engagement by a hit ball for operating said mechanism to advance a player from home plate from

one to four bases depending upon where the ball is hit to.

48. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means including control magnets and electrical contacts therefor operable by engagement with a hit ball for controlling said mechanism to advance a player from home plate to first base responsive to a hit ball and for advancing the player at first base to a subsequent base and another player from home plate to first base responsive to a subsequent hit ball.

49. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means including control electromagnets and control contacts therefor distributed around the field and operable by engagement with a hit ball for advancing a player from home plate to first, second or third base and for advancing another player from home plate to a base and for advancing the first player a number of bases corresponding to the number of bases advanced by the second player responsive to a subsequent hit ball.

50. In an automatic base ball game, a playing field, a playing ball, a pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and means including control magnets and control contacts therefor operable by engagement with successive hit balls for advancing players successively and progressively around the bases.

51. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for placing a said player at any of the bases, and means including control magnets and electrical contacts therefor operable by engagement with a hit ball for operating said mechanism to place a player at base responsive to a hit ball.

52. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over

the playing field, base running players, mechanism for placing a player at first, second, third base or home, and means including control magnets and electrical contacts therefor distributed around said field for engagement with hit balls for operating said mechanism to place a player at one of said four bases responsive to a hit ball and depending upon where it is hit to.

53. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, control means including control magnets and electrical contacts therefor operable by a hit ball for operating said mechanism to advance a batting player from home plate to one of the bases, and sacrifice hit apparatus including electromagnetic mechanism and control contacts therefor distributed around said field and operated by a hit ball for operating said mechanism to advance the player on base and advance a batting player from home plate toward first base but take said latter player out of play before reaching first base.

54. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, electrical contacts distributed around said field responsive each to a hit ball, and control apparatus responsive to said contacts for operating said mechanism to advance a player from home plate to a base responsive to one hit ball and for advancing another player from home plate to first base and the player already on base for a distance more than one base responsive to a subsequent hit ball.

55. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases, and one, two, three and four base control means indiscriminately successively operable responsive to successive hit balls for operating said mechanism to correspondingly advance the players on the bases, said control means including electrical contacts and magnets controlled thereby, said contacts being distributed around the field for engagement by hit balls.

56. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, means for automatically feeding a ball to the pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players,

mechanism for placing a player at any of the bases, and means for operating said mechanism to place a player at a base responsive to a hit ball, said means including out and hit control positions distributed around the field each having a control contact responsive to engagement with a hit ball whereby said mechanism is or is not operated according to whether out or hit contacts are engaged.

57. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for placing a player at any of the bases, out mechanism including electrical contacts and a control magnet responsive to a pitched ball for indicating an out, means including a control magnet and electrical contacts therefor operated by a hit ball for placing a player on the bases, and means for taking the player on base out of play by removal from the field responsive to a predetermined number of operations of the out indicating mechanism.

58. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for placing a player at any of the bases, means including control magnets and control contacts therefor responsive to successive hit balls for operating said mechanism to successively and progressively place and advance players on the bases corresponding to the balls hit, out indicating apparatus including a control magnet and electrical control contacts therefor responsive to pitched balls for indicating outs, and means for taking the players on base out of play by removal from the field responsive to a predetermined number of operations of the out indicating apparatus.

59. In an automatic base ball game, a playing field, base running players, and player advancing mechanism positioned beneath the playing field and including a power driven apparatus carrying said players normally beneath the playing field, means for operating said apparatus to advance the players around the base positions on the field, and means for raising a player above the field for placing such player in play and for lowering the player beneath the field to take the player out of play.

60. In an automatic base ball game, a playing field, base running players, and player advancing mechanism positioned beneath the playing field and including a power driven apparatus for carrying said players normally beneath the playing field, means for operating said apparatus to advance the players around the base positions on the field, and means for raising a player

above the field for placing such player in play and for lowering the player beneath the field to take the player out of play, said advancing apparatus including four belt supports each one located beneath a base position on the field with an endless belt carried on said supports and with said players mounted upon said belt.

61. In an automatic base ball game, a playing field, base running players, mechanism for advancing the players around the bases and positioned beneath the playing field, means for supporting said players on said mechanism normally beneath the playing field, means for operating said mechanism to advance the players around the bases, and means for elevating a player above the playing field when said mechanism is operating to advance the players.

62. In an automatic base ball game, a playing field, base running players, mechanism for advancing the players around the bases and positioned beneath the playing field, means for supporting said players on said mechanism normally beneath the playing field, means for operating said mechanism to advance the players around the bases, means for elevating a player above the playing field when said mechanism is operating to advance the players, said elevating means including a guide for each of the players for permitting elevation of the player, and a runway extending around the base line beneath the playing field having an inclined portion adapted to engage a player when advancing so as to elevate and maintain a player above the field.

63. In an automatic base ball game, a playing field, base running players, mechanism for advancing the players around the bases and positioned beneath the playing field, means for supporting said players on said mechanism normally beneath the playing field, means for operating said mechanism to advance the players around the bases, means for elevating a player above the playing field when said mechanism is operating to advance the players, and means for dropping a raised player beneath the field when advancing from home plate to first base before reaching first base position.

64. In an automatic base ball game, a playing field, base running players, mechanism for advancing the players around the bases and positioned beneath the playing field, means for supporting said players on said mechanism normally beneath the playing field, means for operating said mechanism to advance the players around the bases, means for elevating a player above the playing field when said mechanism is operating to advance the players, said elevating means including a guide for each of the players for permitting elevation of the player, and a runway extending around the base line be-

neath the playing field having an inclined portion adapted to engage a player when advancing so as to elevate and maintain a player above the field, said runway having 5 movable corner sections for dropping advanced players at the first, second and third base positions.

65. In an automatic base ball game, a 10 playing field, base running players, mechanism for advancing the players around the bases and positioned beneath the playing field, means for supporting said players on 15 said mechanism normally beneath the playing field, means for operating said mechanism to advance the players around the bases, means for elevating a player above the play- 20 ing field when said mechanism is operating to advance the players, said elevating means including a guide for each of the players for permitting elevation of the player, and a 25 runway extending around the base line beneath the playing field having an inclined portion adapted to engage a player when advancing so as to elevate and maintain a 30 player above the field, with means for operating the inclined portion so as to prevent elevating an advancing player and maintain 35 said player beneath the field.

66. In an automatic base ball game, a play- 30 ing field, base running players, mechanism for advancing the players around the bases and positioned beneath the playing field, means for supporting said players on said 35 mechanism normally beneath the playing field, means for operating said mechanism to advance the players around the bases, means 40 for elevating a player above the playing field when said mechanism is operating to advance the players, and means for dropping an advancing raised player beneath the field as 45 the player is advancing from third base to home plate.

67. In an automatic base ball game, a play- 45 ing field, four base running players, mechanism for supporting said players normally beneath the playing field with said players 50 spaced one base apart, means for operating said mechanism to advance the players around the bases, and means for elevating predetermined players above the field for ad- 55 vancement around the bases.

68. In an automatic base ball game, a play- 60 ing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running play- 65 ers, mechanism for supporting said players normally beneath the playing field for advancing the players around the bases, and means responsive to a hit ball for operating 60 said mechanism to raise a player above the field and advance such player around the bases.

69. In an automatic base ball game, a play- 65 ing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball

out over the playing field, base running play- 70 ers, mechanism for supporting said players normally beneath the playing field and for advancing the players around the bases, and means for operating said mechanism respon- 75 sive to a hit ball for raising a player above the playing field and to advance the player one to four bases depending upon where the ball is hit to.

70. In an automatic base ball game, a play- 75 ing field, a playing ball, pitching apparatus, batting apparatus, for hitting a pitched ball out over the playing field, base running play- 80 ers, mechanism for supporting the players normally beneath the playing field and for advancing the players around the bases, and means responsive to successive hit balls for 85 operating said mechanism to raise successive players above the field and progressively advance the raised players.

71. In an automatic base ball game, a play- 85 ing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running play- 90 ers, mechanism for supporting the players normally beneath the playing field and for advancing the players around the bases, means responsive to successive hit balls for 95 operating said mechanism to raise successive players above the field and progressively advance the raised players, and means for lowering the advancing raised players as they 100 are moving from third base toward home plate.

72. In an automatic base ball game, a play- 100 ing field having a slot therethrough extending from home plate around the bases and back to home plate, base running players, mechanism for supporting said players nor- 105 mally beneath the playing field and for advancing the players along the base lines around the bases, means for raising an advancing player through the slot above the 110 playing field, and means for again lowering an advancing player beneath the playing field.

73. In an automatic base ball game, a 115 playing field, a plurality of base running players, mechanism supporting said players normally beneath the field for advancing the 120 players one or more bases, means for operating said mechanism to elevate one of said players above the playing field and advance all of the players one or more bases but 125 whereby the elevated player alone shows above the field, and a switch device operative for controlling advancing players whereby when all of said players are being 130 advanced more than one base all but the last one of the players advancing toward home plate are dropped and the last one only 135 put in position to be elevated on the next subsequent operation of the advancing mechanism.

74. In an automatic base ball game, a 140

playing field, base running players, mechanism for automatically putting successive players on the field and for advancing the players around the bases; said mechanism including a device supporting the players and adapted to be driven to advance the players around the bases, a motor and connected driving shaft for said device, and control apparatus for variably operating said motor to drive said device and advance the players one to four bases selectively.

75. In an automatic base ball game, a playing field, base running players, mechanism for automatically putting successive players on the field and for advancing the players around the bases; said mechanism including a power driving shaft for rotating said mechanism to advance the players, four control magnets corresponding to the four base positions, and mechanism controlled by said magnets for controlling the operation of the driving shaft for operating the advancing mechanism to advance the players one to four bases according to the magnet operated.

76. In an automatic base ball game, a playing field, base running players, mechanism for automatically putting successive players on the field and for advancing the players around the bases; said mechanism including a rotatable supporting device for the players adapted to be operated to advance the players around the bases, a main driving shaft for said device, a motor for operating said shaft, one, two, three and four base advance control magnets, and a motor control switch for said motor operated by any one of said magnets to operate the motor to advance the players a number of bases corresponding to the magnet operated.

77. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically putting successive players on the field and for advancing the players around the bases; said mechanism including a rotatable supporting device for the players adapted to be operated to advance the players around the bases, a main driving shaft for said device, a motor for operating said shaft, one, two, three and four base advance control magnets, a motor control switch for said motor operated by any one of said magnets to operate the motor to advance the players a number of bases corresponding to the magnet operated, and control contacts distributed around the playing field for engagement by a hit ball for operating said control magnets.

78. In an automatic base ball game, a playing field, base running players, mechanism

for automatically putting successive players on the field and for advancing the players around the bases; said mechanism including an advanceable device supporting the players for advancing them around the bases, a driving shaft for said device, one, two, three and four base control magnets, a common starting device for said shaft operable by any of said magnets when actuated, and individual stopping devices one for each magnet for stopping said shaft after advancing the players according to the particular magnet actuated.

79. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically putting successive players on the field and for advancing the players around the bases; said mechanism including an advanceable device supporting the players for advancing them around the bases, a driving shaft for said device, one, two, three and four base control magnets, a common starting device for said shaft operable by any of said magnets when actuated, and individual stopping devices one for each magnet for stopping said shaft after advancing the players according to the particular magnet actuated; control contacts distributed around the playing field corresponding to said magnets and operable by engagement with a hit ball for operating said magnets to advance the players according to the contacts hit.

80. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically putting successive players on the field and for advancing the players around the bases, means for operating said mechanism to advance the players responsive to a hit ball, and scoring apparatus for registering hits automatically operated responsive to a hit ball.

81. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically putting successive players on the field and for advancing the players around the bases, means for operating said mechanism to advance the players responsive to a hit ball, scoring apparatus for registering hits for opposing sides, and means for automatically operating said apparatus to alternately register hits for opposing sides responsive to hit balls.

82. In an automatic base ball game, a playing field, a playing ball, pitching apparatus,

batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically putting successive players on the field and for placing a player at any of the bases, means for operating said mechanism to place a player at a base responsive to a hit ball, scoring apparatus including two indicators for registering hits each for an opposing side, a common operating device for actuating said indicators, and means for shifting said common operating device from one indicator to the other according to the side presumed to be at bat.

83. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, scoring apparatus for registering hits, hit positions distributed around the field each having a control element actuated by a hit ball, means for operating the scoring apparatus for registering a hit responsive to engagement of a control element by a hit ball and means for automatically returning a hit ball to a batting position.

84. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, scoring apparatus for registering hits individual to opposing sides, control elements distributed around the field operable by a hit ball, and means responsive to the operation of control elements for automatically operating said apparatus to alternately register hits for opposing sides.

85. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, scoring apparatus including two indicators for registering hits each for an opposing side, a common operating device for actuating said indicators, means for shifting said common operating device from one indicator to the other according to the side presumed to be at bat, and control elements distributed around the field operated by hit balls for effecting the operation of the common operating device.

86. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, out positions distributed around the playing field each having contacts responsive to engagement with the ball, scoring apparatus for registering outs automatically operative responsive to engagement by out contacts with the ball, and means for automatically returning a hit ball to a batting position.

87. In an automatic base ball game, a playing field, a playing ball, pitching appa-

ratus, batting apparatus for hitting a pitched ball out over the playing field, scoring apparatus including two indicators for registering outs for opposing sides, an operating device for actuating said indicators, and control elements distributed around the field responsive to engagement with the ball for effecting actuation of the operating device for registering outs.

88. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, scoring apparatus including two indicators for registering outs for opposing sides, an operating device for actuating said indicators, control elements distributed around the field responsive to engagement with the ball for effecting actuation of the operating device for registering outs, and means for restoring the indicators to a zero position after a predetermined number of outs have been registered.

89. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, scoring apparatus for registering the number of outs and the inning and the half of the inning being played, and means for operating said apparatus automatically responsive by engagement with an out ball.

90. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, scoring apparatus for registering hits, outs and innings, and means for operating said scoring apparatus automatically responsive by engagement with said ball after being pitched for registering hits, outs and innings.

91. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing players around the bases and to home plate responsive to hit balls, run scoring apparatus, means for operating said latter apparatus responsive to the advance of each player to home plate to score a run, and means for automatically returning a hit ball to a batting position.

92. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for advancing the players around the bases and to home plate responsive to hit balls, out apparatus responsive to an out ball, hit, run and out scoring mechanism automatically operable to record the hits, runs and outs, and means for automatically returning a hit ball to a batting position.

93. In an automatic base ball game, a playing field, four base running players, mechanism for supporting said players normally beneath the playing field with said  
 5 players spaced one base apart, means for operating said mechanism to advance the players around the bases, means for elevating predetermined players above the field for advancement around the bases, and scor-  
 10 ing mechanism for registering hits and runs operated by an advancing elevated player.

94. In an automatic base ball game, a playing field, four base running players, mechanism for supporting said players nor-  
 15 mally beneath the playing field with said players spaced one base apart, means for operating said mechanism to advance the players around the bases, means for elevating predetermined players above the field  
 20 for advancement around the bases, and hit and run scoring mechanism, automatically operated by passing elevated players but inoperative to advancing players in normal position.

95. In an automatic base ball game, the combination of a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the play-  
 25 ing field, base running players, mechanism for automatically advancing the players  
 30 around the bases responsive to a hit ball, and means for automatically returning a hit ball to a batting position.

96. In an automatic base ball game, the combination of a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the play-  
 35 ing field, base running players, mechanism for automatically advancing the players  
 40 around the bases responsive to a hit ball, scoring mechanism for automatically registering the hits, and means for automatically returning a hit ball to a batting position.

97. In an automatic base ball game, the combination of a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the play-  
 45 ing field, base running players, mechanism for automatically advancing the players  
 50 around the bases responsive to a hit ball, scoring mechanism for automatically recording the number of hits and the number of runs, said runs being indicated by the play-  
 55 ers that are advanced from third base to home plate, and means for automatically returning a hit ball to a batting position.

98. In an automatic base ball game, the combination of a playing field, a playing ball, pitching apparatus arranged to be ac-  
 60 tuated by one hand of the operator, batting apparatus arranged to be actuated by the other hand of the operator for hitting a pitched ball out over the playing field, base  
 65 running players, means for advancing the

players around the bases automatically responsive to hit balls, and means for auto-  
 matically returning hit balls to a batting position.

99. In an automatic base ball game, the combination of a playing field, a playing  
 70 ball, pitching apparatus arranged to be actuated by one hand of the operator, batting apparatus arranged to be actuated by the other hand of the operator for hitting a  
 75 pitched ball out over the playing field, base running players, mechanism for advancing successive players progressively around the bases automatically responsive to successive  
 80 hit balls, and means for automatically returning hit balls to a batting position.

100. In an automatic base ball game, a playing field, a playing ball, means for pitching and batting out said ball over the field, mechanism responsive to said ball after  
 85 being pitched for scoring predetermined plays, and means responsive to a predetermined scoring for rendering the device inoperative for further play.

101. In an automatic base ball game, a playing field, a playing ball, means for pitch-  
 90 ing and batting out said ball over the field, mechanism responsive to said ball after being pitched for scoring predetermined plays, means responsive to a predetermined scoring  
 95 for rendering the device inoperative for further play, a manual lever operative for again rendering the game operative for further play, and means operative responsive to the  
 100 deposit of a coin for permitting normal actuation of said lever to render the device operative for further play.

102. In an automatic base ball game, a playing field, a pitching arm positioned be-  
 105 neath the surface of the playing field, a playing ball and means for automatically feeding the same in the pitching arm, and means for manipulating the pitching arm to raise it above the surface of the field by a pitching  
 110 movement to pitch the ball by rolling it along the surface of the field.

103. In an automatic base ball game, a playing field, a pitching arm positioned be-  
 115 neath the surface of the playing field, a playing ball and means for receiving the same in the pitching arm, mechanism for oper-  
 120 ating the pitching arm to raise it above the surface of the field by a pitching movement to pitch the ball by rolling it along the surface of the field, and a manually operable  
 125 member for controlling said mechanism to operate the pitching arm and automatically retract the arm for successive operation.

104. In an automatic base ball game, a playing field, a playing ball, pitching appa-  
 125 ratus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically put-  
 130 ting players on the field and advancing the players around the bases, and means for

operating said mechanism to advance the players responsive to a hit ball.

105. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically putting players on the field and advancing the players around the bases, and means for operating said mechanism to advance a player from one to four bases responsive to a hit ball depending upon where the ball is hit to.

106. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically putting players on the field and advancing the players around the bases, and means for operating said mechanism to advance the players successively and progressively responsive to successive hit balls.

107. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for placing a player automatically on the field at home plate and advancing said player to first, second, third base or home, and means for operating said mechanism to place a player at one of said four bases responsive to a hit ball and depending upon where it is hit to.

108. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically placing said players on the field and for advancing the players around the bases, and one, two, three and four base control means indiscriminately successively operable responsive to successive hit balls for operating said mechanism to correspondingly advance players on the bases.

109. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically placing said players on the field and for advancing the players around the bases, control positions on said field each having a control element responsive to engagement by a hit ball, and means for operating said mechanism to advance the players according to the element engaged by the hit ball.

110. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically placing said players on the field and for advancing the players around the bases, and means

for operating said mechanism to advance the players responsive to a hit ball, said means including control electromagnets and control contacts therefor distributed around the field for engagement by a hit ball.

111. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus for hitting a pitched ball out over the playing field, base running players, mechanism for automatically successively placing said players on the field and for advancing the players around the bases, and means including control magnets and control contacts therefor operable by engagement with successive hit balls for advancing the players successively and progressively around the bases.

112. In an automatic base ball game, a playing field, a playing ball, pitching apparatus, batting apparatus, and means automatically responsive to manual manipulation of the pitching and batting apparatus to feed the ball to the pitching apparatus.

113. In an automatic base ball game, a playing field, playing balls, pitching apparatus, batting apparatus, base running players, manually operable members for operating said pitching and batting apparatus, and means responsive to operation of said members for operating the pitching and batting apparatus and automatically placing a player on the field and feeding a ball to the pitching apparatus.

114. In an automatic base ball game, a playing field, playing balls, pitching apparatus, batting apparatus, a manually operable member for each of said apparatus for effecting operation thereof, base running players, and means responsive to operation of the pitching operating manual member for operating the pitching apparatus and automatically feeding a ball thereto.

115. In an automatic base ball game, playing balls, a batting apparatus, a manually operable member, and means responsive to each manual operation of said member to feed a ball, operate the pitching apparatus to pitch a ball and retain the batting apparatus to a normal position for a successive like operation.

116. In an automatic base ball game, a pitching apparatus, playing balls, a manually operable member for actuating the pitching apparatus, and means responsive to each operation of said member for actuating said apparatus to pitch a ball and feed another ball to said apparatus for the next subsequent operation thereof.

117. In an automatic base ball game, a playing field having a plurality of ball receiving openings distributed around on said field, a playing ball and means for hitting it out over said field toward said openings to drop therein, base running players responsive to a ball dropping into said openings,

said field being sloped toward each of said openings to prevent a hit ball from stopping between openings on the field.

118. In an automatic base ball game, a playing field, a playing ball, manually controlled means for pitching and batting out a ball over the field, means normally locking

said means against manual control, and means made operative responsive to the deposit of a coin for unlocking said means to permit operation thereof. 10

In witness whereof, I hereunto subscribe my name this 9th day of May, 1925.

EZRA B. ROPP.