Nov. 6, 1934. N. C. WHITNEY 1,980,125

BASEBALL GAME APPARATUS

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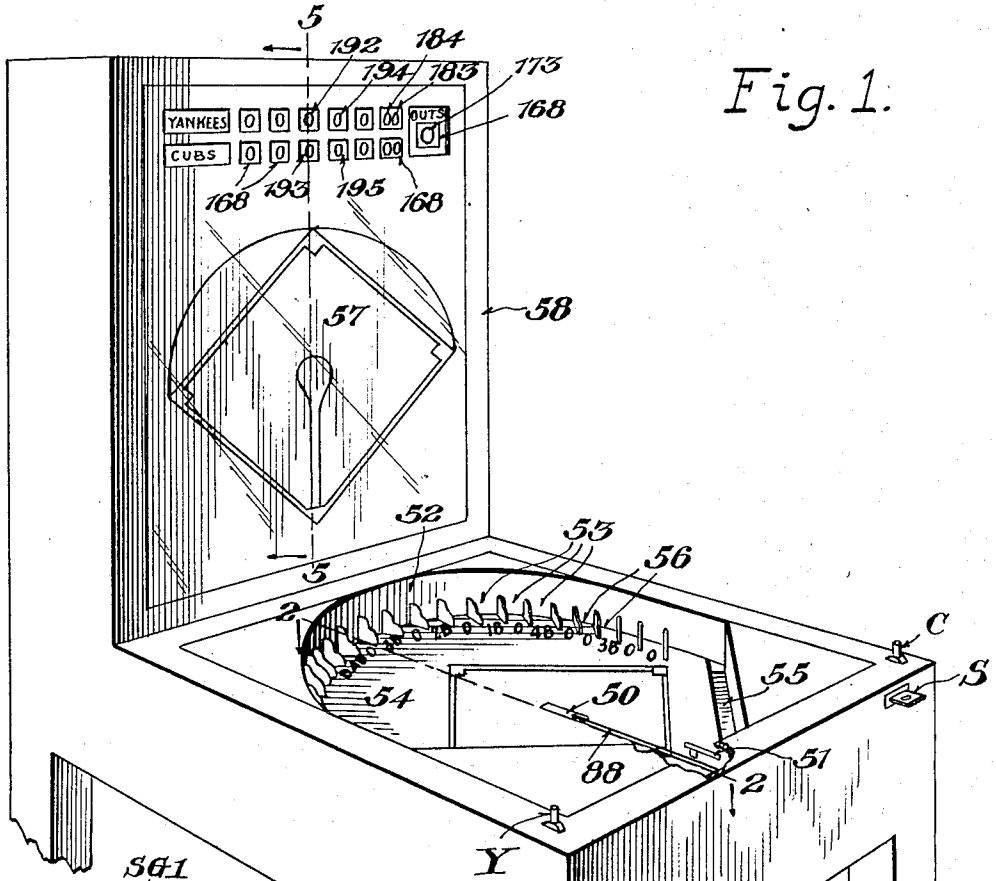


Fig. 1.

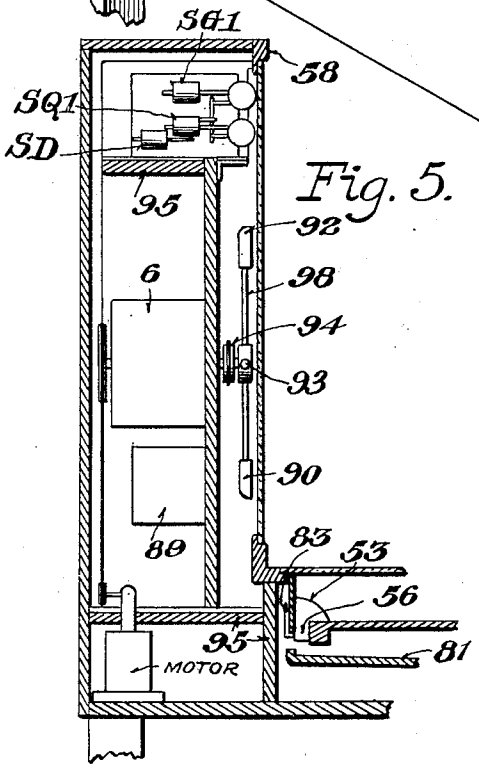


Fig. 5.

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BASEBALL GAME APPARATUS

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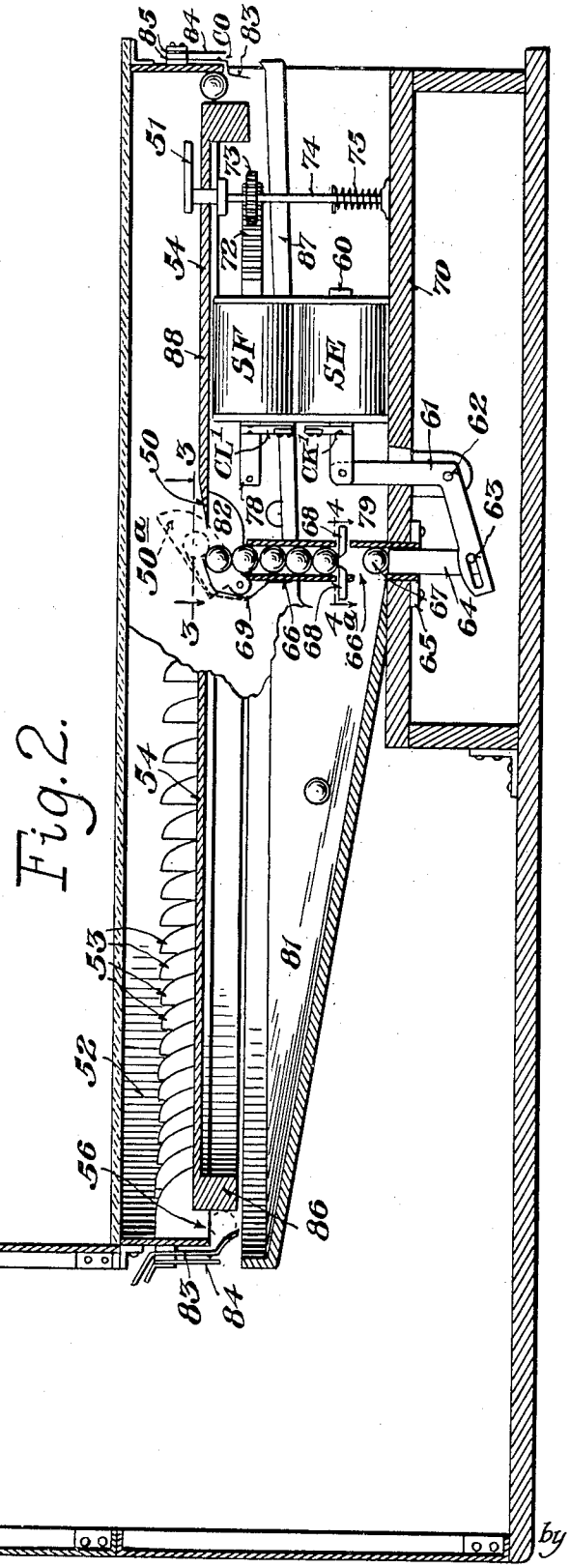


Fig. 2.

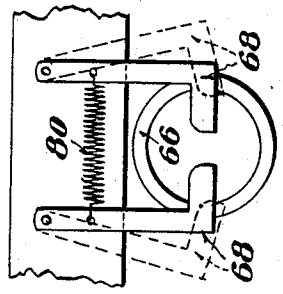


Fig. 4.

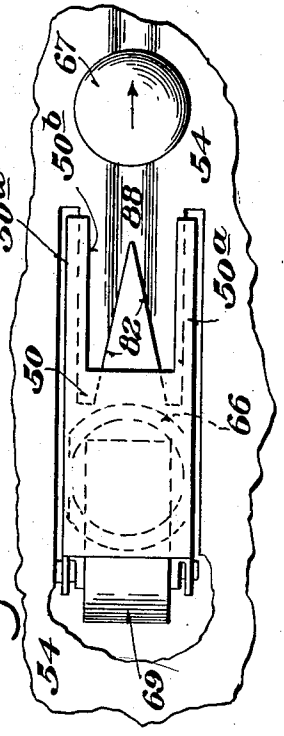


Fig. 3.

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BASEBALL GAME APPARATUS

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Fig. 6.

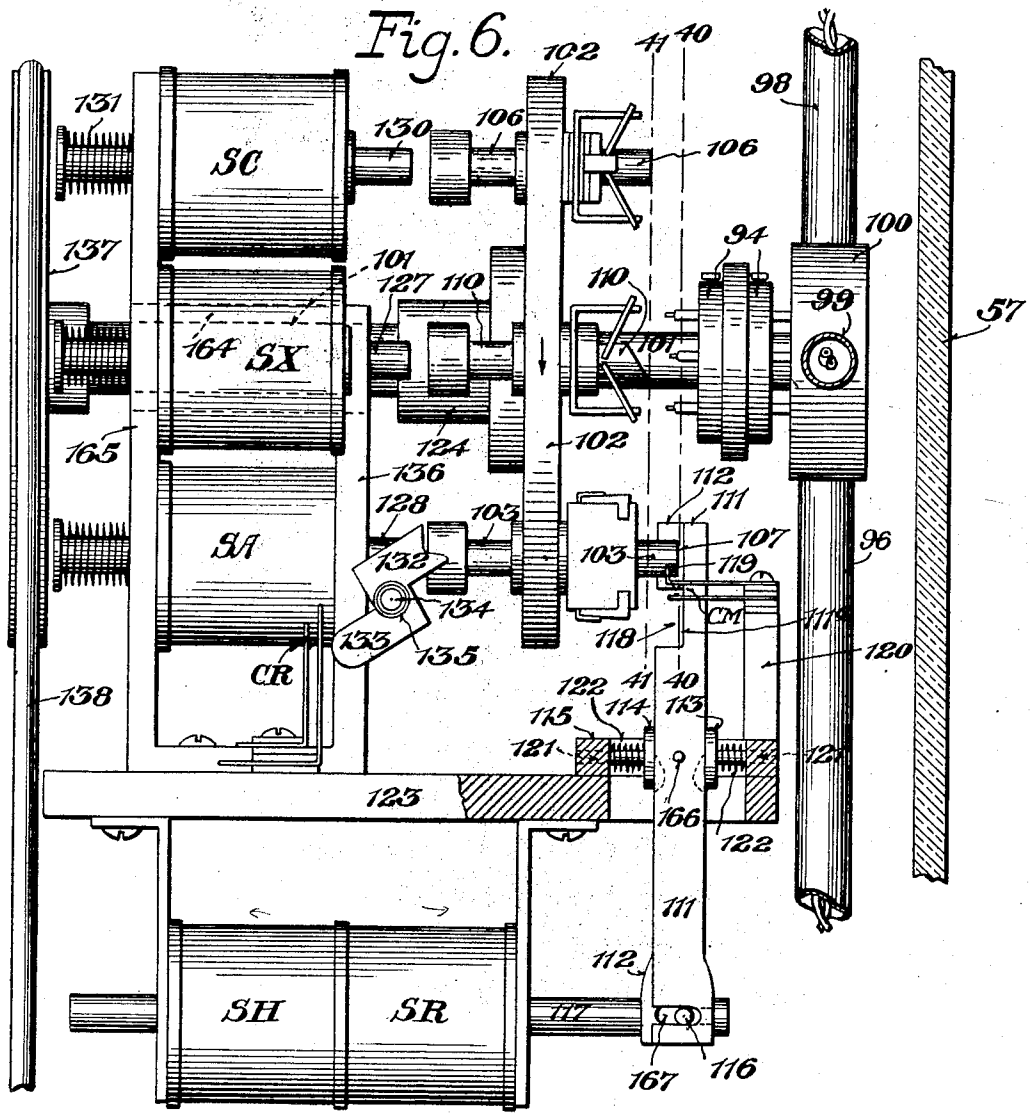
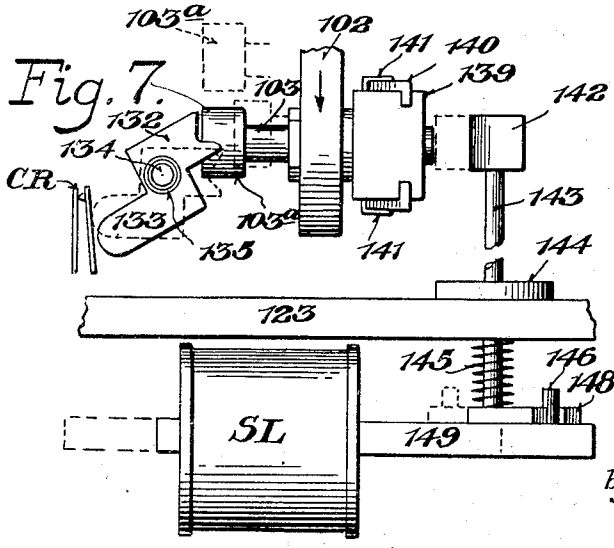


Fig. 7.



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BASEBALL GAME APPARATUS

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Fig. 8.

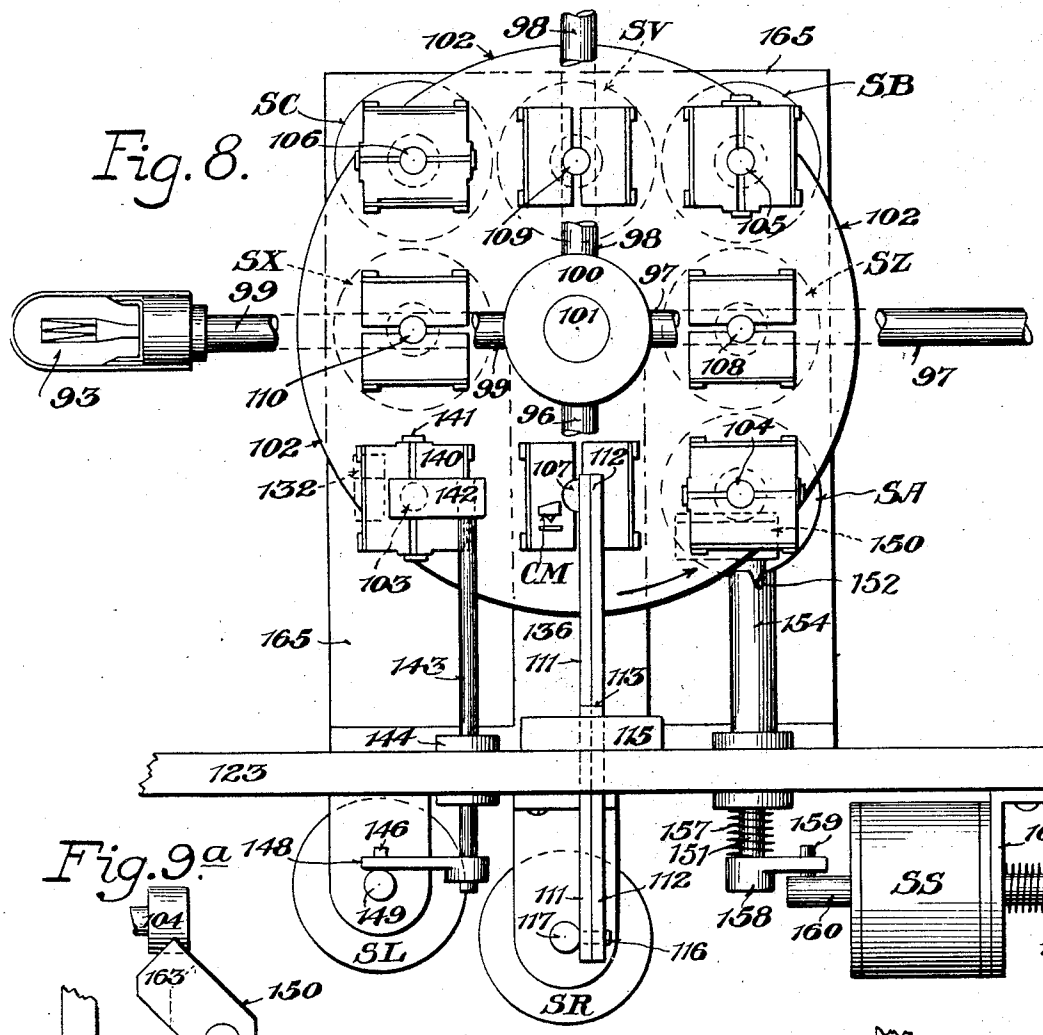


Fig. 9a

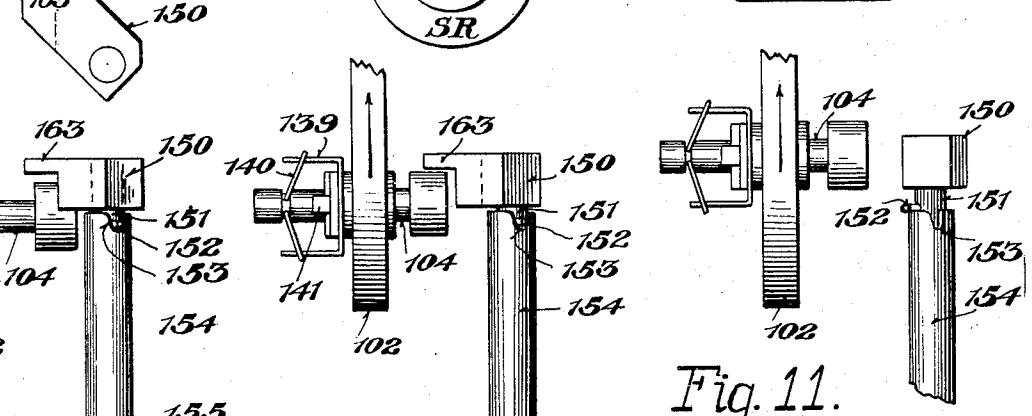


Fig. 9.

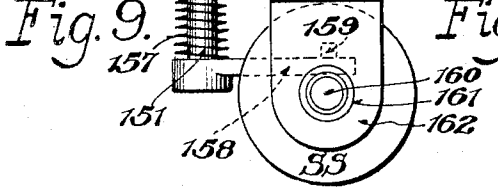


Fig. 10.

Fig. 11.

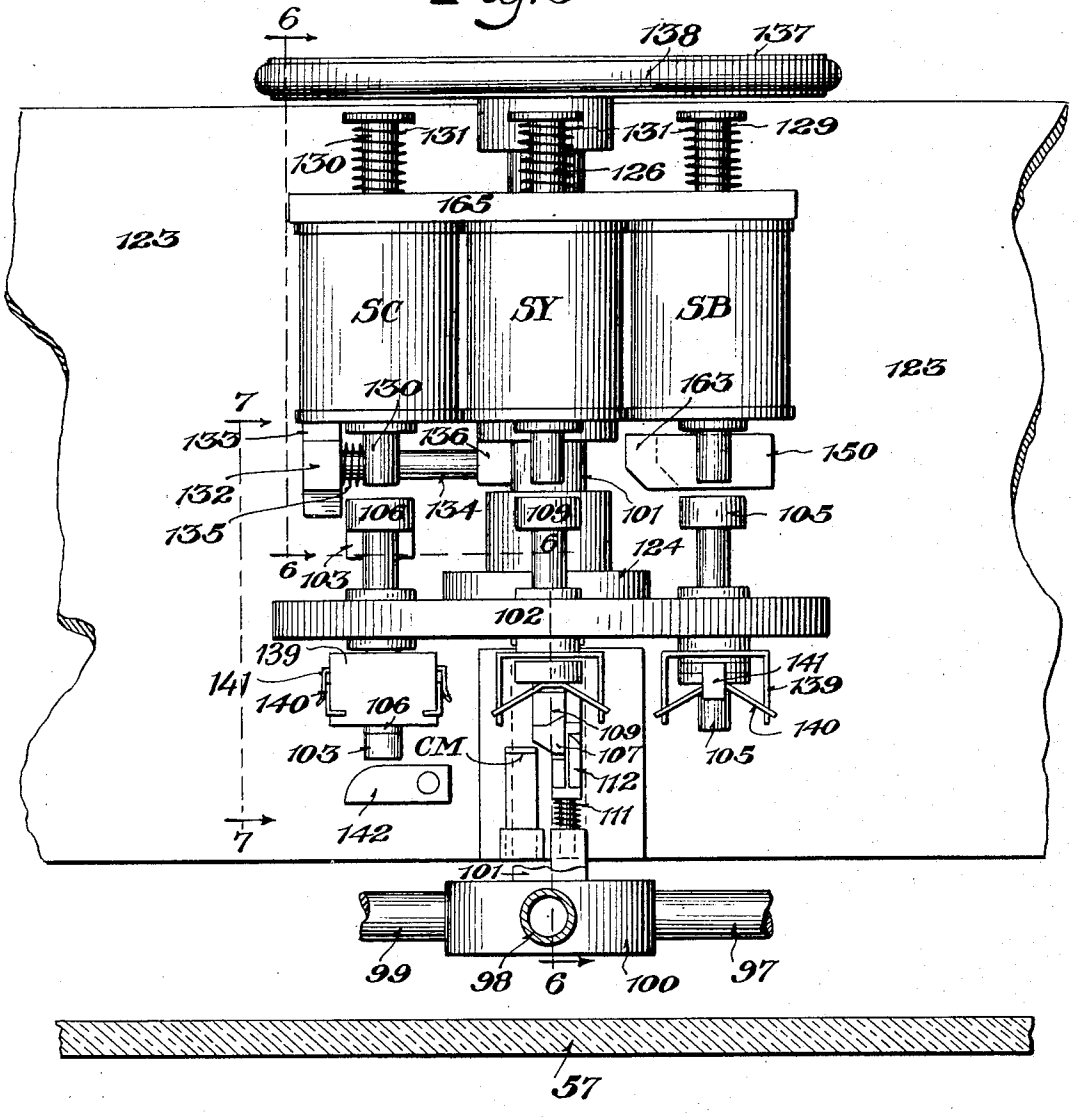
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Fig. 8a



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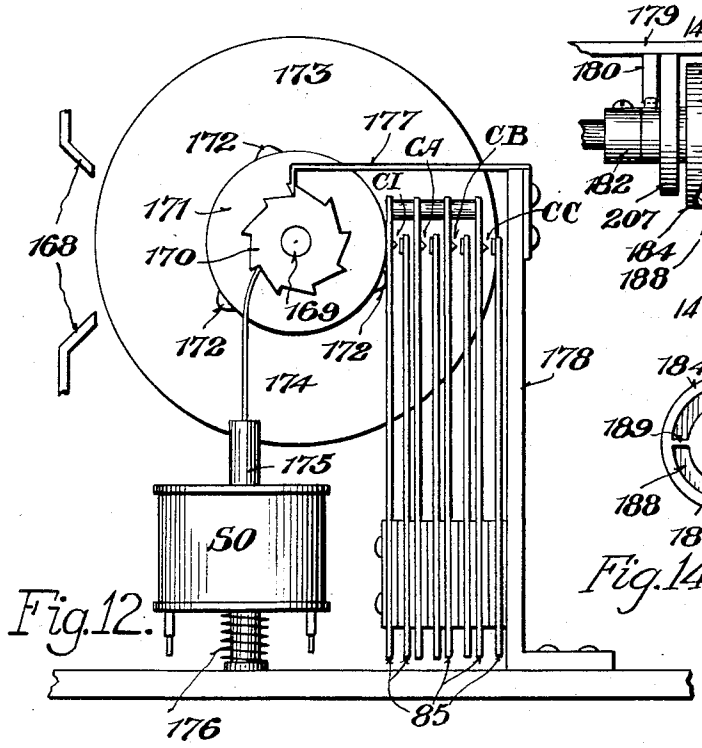


Fig. 12.

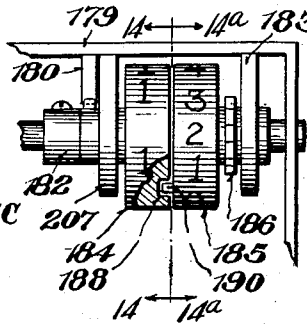


Fig. 13.

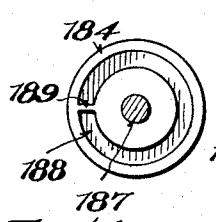


Fig. 14.

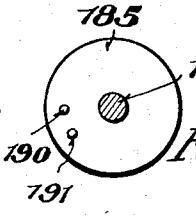


Fig. 14a.

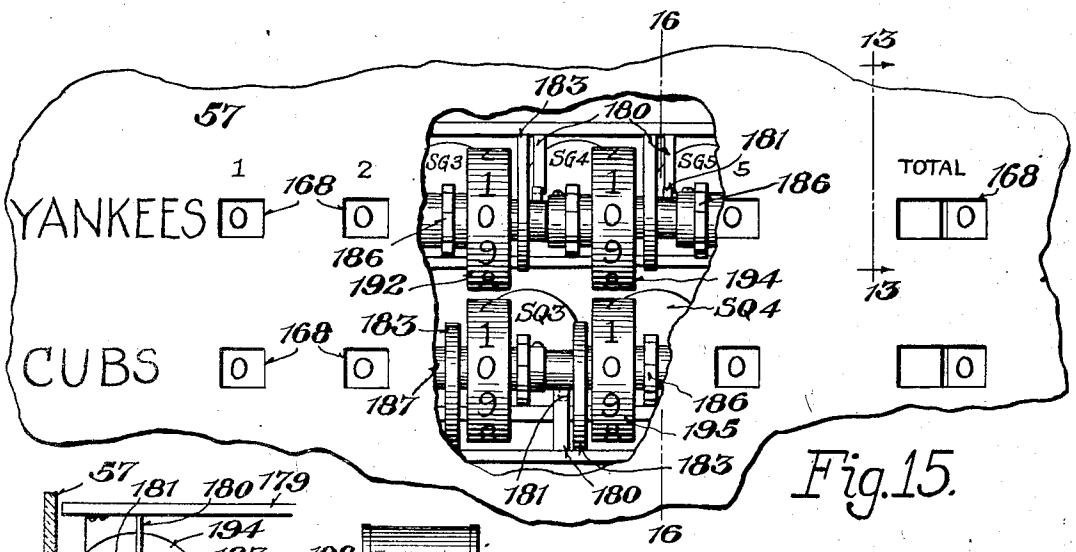


Fig. 15.

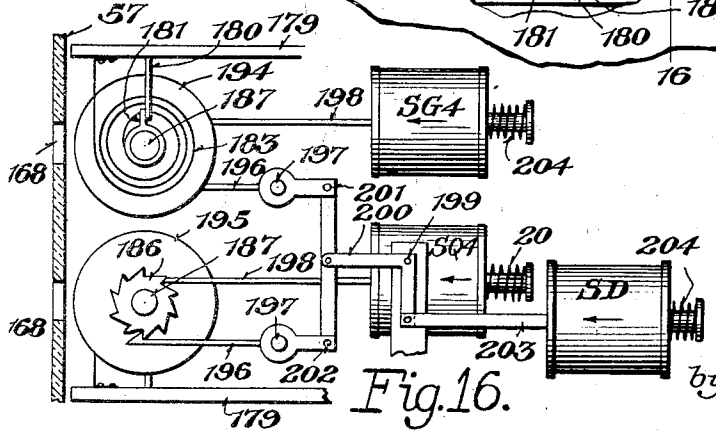


Fig. 16.

Inventor

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by Robert Todd

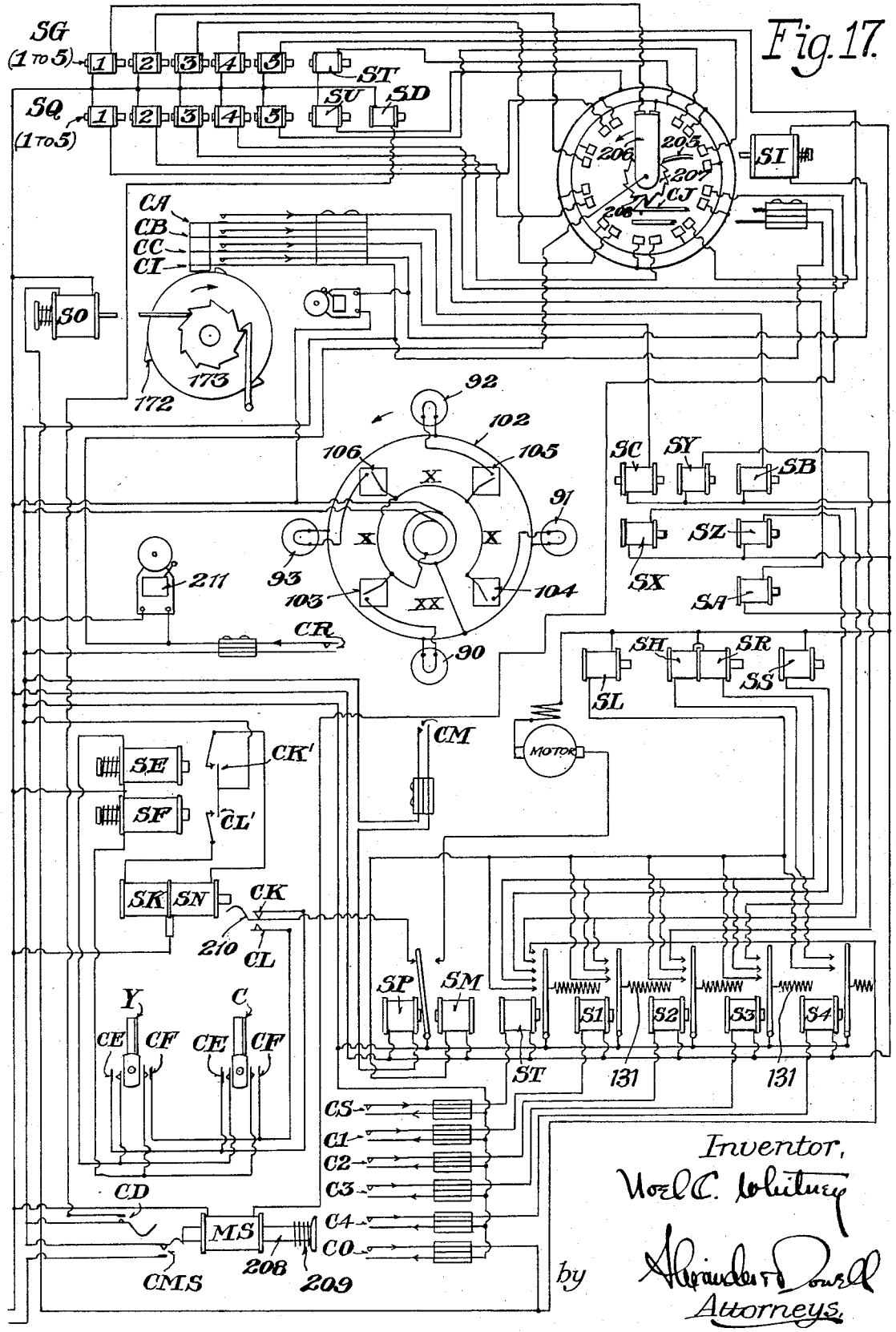
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BASEBALL GAME APPARATUS

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Fig. 17.



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Patented Nov. 6, 1934 1,980,125

UNITED STATES PATENT OFFICE

1,980,125

BASEBALL GAME APPARATUS

Noel C. Whitney, Terre Haute, Ind.

Application December 8, 1932, Serial No. 646,326

25 Claims. (Cl. 273—89)

This invention relates to automatic base ball game apparatus requiring the deposit of a coin to render the apparatus operative, and the principal object of the invention is to provide an electrically operated apparatus requiring skill at the manual controls to operate for a favorable score, same to be played in a manner similar to the regulation game of base ball, with means for automatically recording the score and the movement of the base runners who are represented by symbols on a recording field aside from the actual playing field.

I will explain the invention with reference to the accompanying drawings which illustrate one practical embodiment thereof to enable others familiar with the art to adopt and use the same; and will summarize in the claims the novel features of the invention and novel combination of parts, for which protection is desired.

In the drawings:

Fig. 1 is a perspective view of the complete apparatus, showing the playing field, the recording field, the location of the scoring apparatus and the operating keys.

Fig. 2 is a vertical sectional view through the playing field along the line 2—2, Fig. 1, showing the arrangement of the magnetically operated batting and ball projecting apparatus, also showing the stalls in the outfield, contact springs, and ball return tray.

Fig. 3 is a plan view of the ball projecting apparatus along the line 3—3, Fig. 2.

Fig. 4 is a plan view of the ball elevating tube on the line 4—4, Fig. 2, showing the retaining detents.

Fig. 5 is a vertical section through the recording field along the line 5—5, Fig. 1, showing the relative location of the scoring apparatus, the rotor unit, the revolving base runners' lamps and the relay unit.

Fig. 6 is a side elevation of the rotor unit along the angular line 6—6, Fig. 8*a*.

Fig. 7 is a side elevation of the base runners' symbol lamp lighting device from the line 7—7, Fig. 8*a*.

Fig. 8 is the front elevation of the rotor unit complete.

Fig. 8*a* is a top plan view of the rotor unit showing the location of the various means to actuate the various switch plungers and latch plungers, a portion of the rotor shaft and slip rings being omitted.

Fig. 9 is the side elevation of the sacrifice hit "put out" device which is partially obscured by the rotor disc in Fig. 8.

Fig. 9*a* is a top plan view of the cam and button shown in Fig. 9, the button being about to engage the cam face.

Fig. 10 is a side elevation of the device similar to Fig. 9 at a progressive stage of operation.

Fig. 11 is a view similar to Fig. 10 showing a farther advanced stage of operation.

Fig. 12 is a side elevation of the device for recording the "outs".

Fig. 13 is a front elevation of a portion of the score recording device with front cover removed as along lines 13—13 in Fig. 15, showing one pair of run total recording dials.

Fig. 14 is a section on the line 14—14, Fig. 13, showing the groove in the side of the numeral wheel 184; and Fig. 14*a* is a similar view on line 14*a*—14*a*, Fig. 13, of the cooperating numeral wheel 185 having the pins engaging the groove in the wheel 184.

Fig. 15 is the front elevation of the inning score area of the recording field panel with a section of the face broken out permitting a view of the inning numeral dials.

Fig. 16 is a side elevation of the score recording device showing the numeral dials, operating solenoids and detent release mechanism.

Fig. 17 is the wiring diagram of the complete electrical circuit.

In general my invention as shown in Figs. 1, 2, 3, 4, 5, consists of two base ball diamonds or fields disposed at right angles to the other, one field lying horizontally within the table under a plate glass top and hereafter referred to as the playing field 54, and the other field standing vertically at the opposite end of the table facing the players and hereafter referred to as the recording field 57.

The game is intended to be played by two operators each provided with a double throw playing key Y or C (Fig. 1). The forward movement of either key will cause a ball to be projected across the playing field toward the bat 51 which is pivotally mounted in the playing field 54 in a position which allows its swing to be over and across home plate position. The backward movement of either key Y or C will energize a magnet which swiftly turns the swivel for the bat 51, driving the bat 51 across the path of the oncoming ball. The arrangement of the playing keys Y and C allows each of the two operators to remain in the same position throughout the game without interchanging positions at the close of each half inning.

The operator at the key C (Fig. 1) after depositing a coin in the slot S, opens the game by press-

ing his key forward causing a ball to be projected toward the bat 51. The operator at the Y key presses his key backward at what he believes the proper moment to cause the bat to hit a fair ball into one of the stalls 53, in the outfield, for a play. If the batter hits a fair ball which does not land in a stall designated as an out but lands in a stall designated as a base hit, a lamp will flow behind the transparent home plate on the recording field 57 and travel behind the transparent base lines and bases for a one, two or three base hit, or a home run, depending upon the stall into which the hit ball is rolled. The base running lamps on the recording field 57 remain lighted on the respective bases until brought home by successive plays or until the end of a half inning, at which time the bases are cleared automatically. Lighted lamps arriving at home plate from third base constitute a completed run which the box score apparatus automatically records. Balls hit into stalls 53 designated as "Outs" cause an out to be automatically recorded on the "Out" recorder in the vertical panel 58. Three "Outs" closes the half inning. Lamps designating men on bases are automatically extinguished, a bell signals the operators to reverse the operations of their playing keys and the "Out" recorder returns to zero ready for the start of the next half inning.

The inning score for each successive inning is automatically recorded in the proper frame in the vertical panel 58, and the total runs for each side are automatically registered accordingly. At the close of the last inning a master switch renders the game apparatus inoperative until another coin is inserted in slot S.

I will now explain the construction and operation of the various coordinating units.

The ball projecting apparatus

The ball projecting apparatus is shown in Figs. 1, 2, 3 and 4. It is actuated by the forward movement of either operator key Y or C Fig. 1, which energizes a solenoid SE (Fig. 2) operating a pivoted bell crank lever 61 to force a plunger 64 upwardly into the ball tube 66, forcing a ball 67 against the detents 68 which are forced apart by the passage of a ball and closed by spring 80 (Fig. 4), when the ball has passed, holding the ball above the detents on line 4—4, Fig. 2, until another ball is projected between the detents 68 in the same manner, from below.

Ball 67 is admitted to the ball tube 66 through an opening 66*a* in the side of the tube slightly below the lowest point in the ball collecting tray 81. If plunger 64 is raised at the instant a ball arrives for admittance into the tube 66 it is held back by the side of the plunger until the plunger is lowered. The ball is then permitted to roll by gravity into the opening in the tube where it comes to rest in the concave upper end of the plunger ready to be injected into the tube in the manner above described when solenoid SE is actuated.

The ball tube 66 has a capacity of five balls above the detents 68 at line 4—4. The upper edge of the top ball lies flush with the playing field surface under the end of release spring 69 and under the flanged lid 50.

The injection of another ball into the bottom of tube 66 forces the top ball upwardly against spring 69, forcing open lid 50 which is hinged at one end. As the ball which is forced out of the top of tube 66 approaches the level of the playing field 54 it is forced towards the bat 51 by the hinged weight of lid 50 and is given additional momentum as it passes from under the end of spring 69 which snaps back over the top of the next lowermost ball in tube 66. The ball being forced out is guided into a groove 88, in the surface of the playing field 54 leading to the bat, by the side flanges 50*a* on the lid 50, by the slot 50*b* (Fig. 3) in the top of lid 50 engaging the top of the ball, and by the forked tongue 82 of the playing field section which extends under lid 50 to the ball tube 66.

When the ball has passed from under lid 50 a spring hinge snaps the lid down substantially flush with the surface of the playing field 54 leaving a smooth surface over which the hit ball may roll.

Operation of the bat

The batting mechanism is shown in Figs. 1 and 2. The bat 51 is caused to operate by the backward movement of either operator key Y or C which closes a contact energizing solenoid SF (Fig. 2) forcing a plunger rack 72, which engages pinion 73 on shaft 74, to rotate the shaft with the bat 51 fastened thereto. The bat is normally at rest in a position parallel with the ball groove 88 which extends from the pitcher's box to home plate. When operated, the bat swings rapidly across the path of the ball into a position 180 degrees from normal, and is as swiftly returned over the same course to normal by a spring 75 coiled around shaft 74.

The contacts CL' and CK' (Fig. 2) are part of the electrical interlocking arrangement which forces the operators to alternately project and bat only one ball at a time. The interlock is wholly electrical and will be later described in connection with the electrical circuit. Its purpose is mainly to prevent an operator from projecting two or more balls towards the bat in rapid succession, which might cause the piling up of various plays, one upon the other, before the first play is recorded on the recording field 57 or in the panel 58.

The outfield stalls

There may be any selected number of stalls 53 around the outfield, but in the present embodiment I have shown and described thirty such stalls. The purpose of the stalls is to enable the batter to immediately see the kind of a hit made before the ball passes from sight through the hole 56 at the rear of the stall. The stalls also provide targets for the batter.

Behind and below each stall is a contact spring 83 secured to but insulated from the back stop plate 52. Each spring extends below and under the back stop plate in a manner which will not allow a ball to pass downward through opening 56 without forcing the spring 83 sufficiently to close a circuit sending an impulse to one of the relays in the relay panel or to the "Out" relay.

There are thirty contacts 83, however, there are only six different circuits, several contact springs 83 being in parallel on each circuit. The six circuits form the only operating connection between the playing field and the recording field except one line to the score board detent release which will be explained in connection with the wiring diagram. Through each of the six control circuits mentioned, one of the following plays is enacted on the recording field when a contact spring 83 is forced closed by a ball, namely, a one base hit, a two base hit, a three base hit, a home run, a sacrifice hit, or an "Out".

The impulse caused by the closing of an "Out" contact 83 is sent directly to the "Out" recorder.

The impulse caused by the closing of a contact on any one of the other five circuits is sent to one of five relays in the relay unit 89 (Fig. 5).

An impulse from a contact spring 83 sent over a control wire to the relay unit is forwarded from the relay unit over two or more circuits to various combinations of the solenoid controls in the rotor unit which then enacts the given play by reflecting a lighted lamp or lamps around the bases of the recording field.

I will proceed to describe the rotor unit which I consider the heart of the machine.

The rotor unit

The position of the rotor unit is shown at 6 (Fig. 5) directly behind the center of the glass recording field 57, which glass is opaque except at the bases and along the base lines which are frosted. The reflection of lighted electric lamps reflecting through the frosted glass bases and base lines are symbolic of men or players running the bases as in a regular base ball game.

Referring to Fig. 5 the four base running lamps are lettered as follows:—90 at home plate position; 92 at second base position, and 93 at third base position. The first base position is obscured in Fig. 5, but the running lamp at this position would be 91.

The four base lamps 90, 91, 92 and 93 are preferably elongated such as bung hole or banana lamps, and are equipped with hooded reflectors reflecting directly onto the rear surface of the glass background of the recording field 57. These lamps turn in unison upon a central shaft, however, there is always a part of the elongated bulbs reflecting through the base lines on the recording field when they are lighted, which gives the appearance on the face of the field of lights traveling around the bases along the base lines.

Assuming the game to be in operation and that a combination of impulses has just been forwarded to the rotor unit 6 from the relay unit 89 setting up a two-base hit play within the rotor unit, base running lamp 90, Fig. 5, at home plate would be lighted and would travel the bases making a half turn, around to and stopping at second base where it would remain lighted. All four base running lamps 90, 91, 92 and 93 revolve as a single unit, however, base running lamp 90 would be the only one lighted, and in the play just enacted the other three base running lamps, being extinguished, could not be seen through the frosted glass bases and base lines.

Supposing the next play is a three base hit, the relay panel would send the proper combination of impulses to the rotor unit 6. Lamp 90 is standing lighted behind second base, therefore, lamp 92 is resting behind home plate. Lamp 92 becomes lighted, the rotor makes a three quarter turn stopping with lamp 92 lighted behind third base, however, lamp 90 which was lighted behind second base when the play started was brought around through home plate position where it was extinguished passing on to first base position unlighted and unseen after being extinguished at home plate position.

I will now take up the detailed construction of the rotor unit shown in Figs. 6, 7, 8, 8*a*, 9, 10, 11.

Fig. 6 shows a side elevation of the rotor and its assembly. The hub 100 on the shaft 101 supports the four brackets 96, 97, 98 and 99 which in turn support the four base running lamps 90, 91, 92 and 93 respectively. A rotor disk 102 is also keyed to shaft 101 and revolves with the shaft, base running lamps, and the slip rings 94. The rotor shaft 101 is journaled in bearing 164 mounted between brackets 136 and 165.

The disk 102 serves as the mounting base for the revolving lamp switches 103, 104, 105 and 106 (Fig. 8) which are mounted around the disk 90 degrees apart. The rotor disk 102 also serves as the mounting base for the revolving stop latches 107, 108, 109 and 110 (Fig. 8) which are also mounted around the disk at 90 degree intervals, each stop latch being spaced forty-five degrees from a lamp switch and slightly nearer the center of the disk so that their plungers may travel a different pitch circle from those of the switches, as shown in Fig. 8.

The stop latches and switch plungers are of the same construction although the stop latches are not used as electric switches. They are of standard manufacture, an ordinary push-pull switch with plungers which spring in or out past dead center. Fig. 7 shows a lamp switch 103 mounted on a section of the rotor disk 102. The plunger 103 has a head 103*a* formed on one end. The other end is plain but extends beyond the spring clamp hereinafter described. The plunger may therefore be operated from either side of rotor disk 102. The spring clamp 139 (Fig. 8*a*) holds toggles 140 tightly into a groove in the plunger 103 causing the plunger to spring past center to an on or off position when it is pushed at one end or the other. Contact spring clips 141 are used on the four switches 103, 104, 105 and 106. The electrical contact across the clips 141 is closed by the toggles 140 when the switch plunger 103 is pushed to "on" position by cam 142. Switch plungers 103 extended to line 40—40 (Fig. 6) denote the switch is in "off" position, and when shown extended only to line 41—41 (Fig. 6) they are in "on" position.

Latch plungers 107, 108, 109 and 110 are on "stop" position when they are extended to line 40—40, Fig. 6; and are in "open" or non-engaging position when extended only to line 41—41.

The balance of the apparatus of the rotor assembly is for the sole purpose of operating the four switches and the four latches just described.

The switches control the base runners' lamps, while latches control the distance the rotor may travel i. e. a quarter, half, three quarter or complete revolution.

The "home" or stop position for latches 107, 108, 109 and 110 is at the position of 107 Fig. 8, that is, with the plunger against the side of trigger 112 and in opposition to trigger 111.

There are two latch triggers 111 and 112, Figs. 6 and 8. Trigger 111 is cut away as at 111*a* (Fig. 6) to permit the extended latches to strike against trigger 112 which places the end of a latch directly opposite the edge of the trigger 111 which can be operated by the action of solenoid SR forcing the contacted latch plunger back to normal, releasing it from contact against trigger 112 when each new play calling for a run or turn of the rotor is made, except in the event of a home run when solenoid SH draws back trigger 112 to "pass" the latch in its "stop" position engaging the same plunger once again after one complete revolution of the rotor.

The triggers 111 and 112 are placed side by side as in Fig. 8. Again referring to Fig. 6, these triggers are pivoted at 166 (Fig. 6) through the base plate 115 and are held secure in upright alignment by shoes 113 and 114 which are pressed tightly against the edges of triggers 111 and 112 by the springs 122 fitted over the shoe plungers

121 which operate through their respective guides drilled through the base plate 115.

The tandem solenoids SH and SR (Fig. 6) operate the triggers 112 and 111 respectively. Slots 167 are cut into the triggers from opposite sides so when solenoid SR forces plunger 117 and the engaging pin 116 outwardly only trigger 111 is operated, the slot 167 in trigger 112 being open at one end and allowing pin 116 to merely slide therein while operating to move trigger 111. When solenoid SH is operated to draw plunger 117 inwardly to operate trigger 112, trigger 111 is likewise undisturbed.

Considering only the action of the rotor starting and stopping apparatus, the action which takes place to manipulate a one base hit requires a quarter turn of the rotor. Referring to Fig. 6, solenoid SX receives an impulse from the relay unit 6 causing its plunger 127 to operate, striking latch plunger 110 setting it out to "stop" position. Solenoid SR also received an impulse at the same instant as did SX which caused the plunger 117 to operate the trigger lever 111 in a direction which forced plunger 107 to open or free position, to clear trigger 112, allowing the rotor to be turned by the motor until plunger 110, which was set to "stop" position, engages trigger 112 after a quarter turn of the rotor.

Trigger 112 is normally in line to engage any latch plunger arriving in "stop" or extended position, thus stopping the rotor in exact designed spot, however, any latch plunger 107, 108, 109 or 110 set out to stop position, engages and makes contact CM (Figs. 6 and 8) which operates the motor control, shutting off the motor current, an instant before the stop latch strikes against trigger 112.

If the play just mentioned had been a three base hit instead of a single, the set up would be the same excepting solenoid SZ, (Fig. 8), would have set latch 108 (instead of solenoid SX setting latch 110) to stop position, in which case latch 108 would have traveled in the customary counter clockwise direction for a three quarter turn until it engaged the contact CM and came to rest against trigger 112.

The four switches 103, 104, 105 and 106 (Fig. 8) are so arranged that three of them are behind and in alignment with the plungers of the solenoids SA, SB or SC when the rotor is at rest on any quarter. The remaining switch, 103 in Fig. 8, is in the home position for lamp switches behind the cam 142 (Figs. 7 and 8). Cam 142 is mounted in front of the rotor and is operated pivotally by solenoid SL. It is mounted on shaft 143, held at normal position by spring 145 and operated by lever 148 engaged by pin 146 on plunger 149. Its function is to throw the plunger of any switch in the home plate position, closing the switch and lighting the base runners' lamp at home plate position, whenever a run is to be started around the bases. Solenoids SA, SB and SC are located behind the rotor and operate only at the close of an inning to throw the switches controlling base runners' lamps at first, second or third base to "off" position at the end of each inning thus clearing the bases.

When a sacrifice hit play is made, a kick off cam 150 (Figs. 8 to 11 inclusive) is set up slightly ahead of the first base position for switches, which is at 104 in Fig. 8. The cam 150 is behind the rotor in Fig. 8 and is better shown in Figs. 9, 10 and 11. The cam 150 is set up by an impulse from the relay unit which operates solenoid SS which operates plunger 160, on which pin 159 is fastened. The pin 159 is engaged in the slotted lever 158 and operates the lever turning the swivel shaft 151 in housing 154 causing cam 150 to be thrown across the path of the next arriving plunger button 104. The impulse from the solenoid SS was practically instantaneous, however, the mechanism once thrown remains locked in the thrown position due to pin 152 becoming engaged in the slot 153 being held there more or less firmly by the action of coiled spring 157 (Fig. 9).

Fig. 11 shows the sacrifice hit cam in its "off" or normal position. Fig. 9 shows the cam "locked" in the path of an oncoming switch plunger button 104. The extension above Fig. 9 is a plan view showing the oncoming plunger button about to engage the angle of the cam face beneath the flange 163. The cam 150, being locked in position as described, forces the plunger button 104 to "off" position when the button on plunger 104 strikes the angular face of the cam, however, the plunger 104 will not clear the upper flange 163 of the cam as shown in Fig. 10 and as the plunger button rises beneath the flange 163, in its rotation with the rotor, it lifts the cam 150 shaft and pin 152 sufficiently for pin 152 to clear the slot 153, whereupon spring 161 Fig. 9, on shaft 160 is enabled to swing the entire mechanism around sufficiently to clear or pass the next plunger button, whether the button is "off" or "on", without interference, as in Fig. 11. In other words the cam 150 throws the switch plunger which in turn throws the cam back to normal.

Any base runner lamp which has remained lighted and which has successfully traversed the round of the bases is extinguished slightly before it reaches home plate position by the action of its particular switch plunger 103, 104, 105 or 106 during its rotating motion with the rotor engaging the face of the pivoted cam 132, Figs. 6 and 7. In Fig. 7 the dotted lines show the position of a switch plunger button in "on" position about to engage cam 132. When the engagement is made cam 132 is forced downward to a horizontal position as shown by the dotted lines Fig. 7. The downward rotating action of plunger button 103*a* onto pivoted cam 132 (Fig. 7) forces the plunger to "off" position opening the circuit of the base runner lamp which is arriving at home plate position. It also causes the heel 133 of the cam 132 to close contact CR which sends an impulse to the scoring apparatus and rings a bell, described in the wiring diagram. If all four plungers are extended, indicating the bases are full, and supposing the last hit to be a home run, the cam engages each switch plunger button as it swings by the home plate "shut off" position, automatically extinguishing all base runners' lamps, in turn, as they revolve through home plate position. The plunger which comes to a stop in home plate position for switch plungers, 103 in Figs. 6, 7 and 8, has revolved slightly beyond the cam 132 sufficiently to allow cam 142 to throw it "on" again, for the next run to leave home plate, without the plunger button 103 striking cam 132.

Cam 132 is pivoted on shaft 134 and held at the angle shown in Figs. 6 and 7 by the coil spring 135 on shaft 134, when the cam is not engaged with a switch plunger. The cam 132 is not extended sufficiently to allow it to engage switch plungers passing it in "off" position.

To sum it up briefly, the four lamp switches 103, 104, 105 and 106 are operated to "off" position by five mediums of control located behind the rotor, namely, any of the three solenoids SA, SB,

SC, the sacrifice hit cam 150, or cam 132. The particular switch operated depends upon the position of the rotor disk. However, none of the four above mentioned switches can be thrown "on" except in the home plate position for switches, which is at 103 in Fig. 8, by the cam 142 located in front of the rotor in Fig. 8 and shown in detail in Fig. 7.

Any of the stop latches 107, 108, 109 and 110 may be thrown to "stop" position when at rest in the positions given 108, 109 and 110 in front of solenoids SX, SY or SZ, Fig. 8, the particular latch thrown depends upon the position of the rotor. The above mentioned stop latches can only be thrown to off position when located in the home position for stop latches which is opposite trigger 111, as 107 Fig. 8. Stop latches are thrown to "off" or inoperative position by the trigger 111 each time the rotor starts to turn, excepting in the case of a home run when trigger 112 releases the latch it is holding engaging the same latch after it has made one complete revolution with the rotor.

The out relay

The "out" relay (Fig. 12) performs triple duty. Its dial 173 signals the number of "Outs" made each inning, through aperture 168 in the vertical panel 58. At the end of each inning or at every third out, one of the cams 172 on dial 171 operates the contact springs making and breaking contacts CI, CA, CB and CC. Contact CI operates solenoid SI (Fig. 17) setting the forwarding switch ahead one pair of contacts or one-half inning in connection with the score board, which will be more fully explained with the wiring diagram. Contacts CA, CB and CC operate solenoids SA, SB and SC of the rotor unit which causes any lighted base lamps on first, second or third base to be extinguished, clearing the bases after each half inning as explained when discussing the rotor unit.

The source of the impulses received by the solenoid SO, which operates the out relay, was explained in the general description and will be discussed further on. When such impulses are received the plunger 175 Fig. 12, causes the spring pawl 174 to set the nine point ratchet 170 ahead one tooth. The ratchet is held by detent 177.

A movement equivalent to the space of three ratchet teeth completes one operating cycle of the unit, however, a ratchet with more than three teeth can be operaed with less difficulty and since a dial of comparatively large circumference is desirable, a nine tooth ratchet was selected. Therefore, the three contact closing cams 172 appear on the cam wheel 171 at intervals of one-third of its circumference. The movement of a space equal to three teeth on the ratchet will cause one of the cams 172 to make and break contacts CI, CA, CB and CC. The numbers of the outs, 1, 2 and 0 are printed on the face of the dial 173 three times each in the nine segments of the dial.

Contact CI, on the "Out" relay, controls the movements of the forwarding switch as partially explained. The forwarding switch is shown only in the wiring diagram Fig. 17, which shows its basic design. It is operated by solenoid SI. Its duty is to switch the impulses, which designate completed runs made on the recording field, to the scoring solenoids of the proper half inning on the score board and to the proper total run register.

The forwarding switch

With continued reference to Fig. 17 the forwarding switch solenoid SI controls the movement of the wiper 206 which connects with the ten pairs of contacts within its radius. One contact in each of the ten pairs leads to one of the score board solenoids of which there is one for each half inning. The other contact in each pair leads to one or the other of the two total register solenoids ST and SU. As wiper 206 is advanced each half inning by solenoid SI which drives the pawl 205 to operate the ratchet 207 held in place by detent spring CJ, the wiper alternately connects the total register solenoids ST and SU and advances connection with the half inning solenoids SG1, SQ1, SG2, SQ2, SG3 and so on to SQ5 to the completion of a game of five innings. However, any number of innings may be applied to the game but in this case five innings were chosen, permitting the adaption of a standard manufactured rotary switch which can be obtained from the manufacturer's stock.

The box score apparatus

The method in which the impulses are directed to the score board having already been explained, I will begin the discussion of the scoring apparatus with reference to Fig. 15, which is a view of the box score board as it appears in the upper portion of the recording field 57, excepting a fragment of the recording field glass face has been removed to permit a view of the separate inning numeral dials of the third and fourth innings.

Referring to Fig. 16, SG4 is the solenoid which operates the numeral dial 194 which incidentally registers the runs made in the first half of the fourth inning. The dial is numbered from 0 to 9 on its face as partially shown in Fig. 15. The position with 0 opposite the aperture 168 is considered normal. An impulse designating a run in the first half of the fourth inning causes solenoid SG4 to operate the spring pawl 198 turning the ten tooth ratchet, alike 186 on the dial below, forward one tooth causing the dial to turn the next higher number printed on its face to a point opposite the aperture 168.

It is quite unlikely a score of more than nine runs will be made during any half inning. However, if desired, the number of numerals on the dials and teeth on the ratchets 186 may be increased.

When the inning numeral dials are turned in the manner just described, they are operated in opposition to the coil springs 183 which are connected to the frame 179 and to the dial hubs, however, the dials are held in each step position by the spring detents 196 (Fig. 16).

The operation of each of the ten half inning dials is precisely the same.

Solenoid SD (Fig. 16) controls all the detents on the score board including the two detents on the total score recorders. The method in which solenoid SD is energized will be explained later on. However, when solenoid SD is caused to act, it pushes forward on plunger 203 causing the pivoted bell crank lever 200 to lift the connecting rod between the pivots 201 and 202 which in turn tilts all detent arms 196, which are secured to the upper and lower connecting shafts 197, downwardly away from and releasing the ratchets 186 which permits the coiled springs 183 on each individual dial to return the dials to normal. The dials are stopped and held at nor-

mal by the lugs 181 on the dial hubs when they strike the detents 180 which are fastened to the frame 179.

The total score recording dials are similar to the inning dials except there is a pair of them side by side in each of the two run total recorders as shown in Fig. 13. The dial 185 at the right is the unit dial and the one at the left the tens dial 184. The unit dial 185 is operated in exactly the same manner as the individual inning dials which have been described, however, after one revolution of the unit dial 185, to the count of 9, pin 191 (Fig. 14), extending from the side of dial 185 into the circular groove 188 in the side of the tens dial 184, strikes the web 189 across the groove 188 causing the tens dial to turn with the unit dial on the second revolution of the unit dial.

The segment of the tens dial 184 which shows through the aperture, when the dial is at normal, is blank. The other nine divisions are marked with the numeral 1. The segment of the unit dial 185 showing through the aperture when the dial is at normal is marked zero the remaining nine divisions are numbered 1 to 9. The tens dial 184 is held at normal by the tension of spring 207 holding the lug 181 against the detent 180, (Fig. 13). The unit dial 185 is held at normal by the pin 190, in its side, engaging the web 189 in the circular groove in the side of the tens dial 184, the spring 183 on the unit dial holding the dial 185 with pin 190 against the web 189 (Figs. 13 and 14).

When the unit dial 185 is moved by pawl 198 (Fig. 16), the pins 190—191 are free to revolve away from web 189 in the groove 188 until the tenth movement of the unit dial 185 whereupon pin 191, which has traversed the circular groove 188 in the tens dial 184 (Fig. 14) ahead of pin 190, strikes the web 189 which forces the tens dial to turn with the unit dial on the second revolution of the unit dial. This causes the numeral 1 to appear on the tens dial before the zero on the unit dial, showing the two digit numeral 10. All numerals on the tens dial being 1, the count continues to show correctly up to and including 18 as the two dials turn together. Briefly the unit wheel 185 keeps the count up to 9 whereupon the tens dial is automatically operated placing the numeral 1 in front of each numeral on the unit dials during its second revolution thus continuing the score in two digits to the count of 18 or more if the steps of the wheels should be rebuilt to greater capacity.

When released by the SD mechanism which releases all detents on the inning numeral dials, springs 207 and 183 act to return both dials 184 and 185 to normal, the tens dial turns back one revolution where its lug 181 strikes detent 180 while the unit dial continues to turn back a second revolution until pin 190 revolving in the groove 188 of dial 184 strikes the web 189 in which case both units and tens dials rest at normal as in Fig. 13. Fig. 13 shows only the total dials which score for the Yankee team, however, the total dials for the Cubs team is identical in operation.

The wiring diagram

The operation of the master switch solenoid Fig. 17, and the purpose of the contacts CD, CMS and CJ is as follows:—

The master switch solenoid MS, shown at the lower left in Fig. 17, is provided with a plunger 208 which is to be interlocked with some standard coin receiving device which will prevent a prospective operator pushing the plunger 208 to operating position closing the contacts CD and CMS, until a coin has been properly inserted. Whereupon, the operator may proceed according to instructions and push plunger 208 inward far as possible, which will close contacts CMS and contact CD. Contact CMS closes the circuit rendering the game operative. Contact CD is closed only so long as the operator manually offsets the tension of spring 209 by pushing inwardly on plunger 208. Contact CD sends an impulse to solenoid SD on the score board which, in turn, releases all the detents which are holding the scoring, numeral dials in the position in which they were left at the end of a previous game.

The operator, following instructions, will hold the plunger 208 inward, keeping the contact CD closed until all scoring dials on the score board return to zero, whereupon the hand of the operator may be released from the plunger 208. The spring 209 then draws the plunger outward sufficiently to allow contact CD to open. All numeral dial detents then become reengaged with their respective ratchets. Spring 209 is not of sufficient length to draw the plunger from its engagement with contact CMS, therefore, the master switch remains closed, the score board has been cleared, the dial detents reset and the game apparatus is ready for play.

There are five each of the six recording control contacts CS, C1, C2, C3, C4 and six like contact CO, (Fig. 17), making a total of thirty-one, and these contacts are lettered in Fig. 2 as 83. The duplicates are wired in parallel across their respective circuits—six circuits in all. Thirty of the contacts are arranged in the outlets 56 (Fig. 2) of the thirty outfield stalls 53. The extra CO contact is placed in the outlet beneath the strike out outlet in the stall behind the bat as shown in Fig. 2. However, the arrangement is not necessarily confined to the order described which only serves as basic description.

The contacts just described are so arranged in the various outlets 56 so they are closed or "made" by the falling of a ball through the outlet.

The slightly convexed surface of the playing field will not permit a ball to stand upon its surface. Therefore, no matter how they are hit all balls must roll into one of the stalls 53 or into the foul ball groove and outlet 55 Fig. 1. The right and left foul ball outlets, 55 (right) being shown in Fig. 1, have no contacts but pass the ball into the receiving tray 81, Fig. 2, without other action.

The game being open for play as previously described, the operator at key C, opens the game by pressing the key in the direction which closes contact CE, which sends an impulse to solenoid SE, which operates, projecting a ball across the playing field toward the bat. This action also caused the plunger of the SE solenoid to make and break contact, CK' which sends an impulse to solenoid SN causing its plunger to depress the spring 210, breaking contact CK and making the contact CL. The breaking of contact CK renders the ball projecting apparatus inoperative from the playing keys, Y or C, and the making of contact CL connects the batting apparatus through to the playing keys, Y or C.

Then the opposing operator, who is at bat, operates his key Y, in a direction to close contact CF, which sends an impulse to solenoid SF, operating the batting mechanism and making and

breaking contact CL' sending an impulse to solenoid SK, which draws the plunger back to permit the spring 210 to break contact CL and again make contact CK, connecting the ball projecting apparatus with the Y and C playing keys once again.

The last operation described concludes the description of one complete cycle of the ball projecting and batting electrical system, which also includes the interlock device at contacts CL and CK, and which also relieves the operators of the responsibility of breaking the circuits rapidly to protect the contacts CF and CE at the operators keys Y and C.

Should a batting operator miss the projected ball, the ball drops through a stall outlet located in the position of the catcher's box CO, Fig. 2, on the playing field, where it makes and breaks a CO contact, registering an out.

The construction and operation of all parts and units now having been thoroughly discussed, a few examples of different plays traced through the circuits shown in the wiring diagram Fig. 17, will be sufficient to complete a thorough conception of the complete apparatus.

Supposing a ball has been struck into an "Out" stall 53 or has passed into the "Out" stall located in the catcher's position on the playing field, one of the six CO contacts is caused to make and break by the passing of the ball through the contact 83, 84 (CO) through the outlet. Contact CO in the wiring diagram can represent any of the six CO contacts since they are wired in parallel. By following the direction of the arrow head on the upper spring of the CO contact, Fig. 17, the circuit of the impulse may be traced directly to the out relay solenoid SO, which operates that unit in the manner previously described.

Assuming the next hit ball operates a C1 contact for a one base hit, by following the direction of the arrow head on the upper spring of contact C1, the impulse is directed to relay solenoid S1 which operates to make and break three circuits. One impulse being directed to the solenoid SX which operates to set out the stop latch plunger on the rotor disk 102 which will stop the rotor after a quarter turn. An impulse is also directed to solenoid SR which operates the trigger 111 setting the engaged stop latch held at home position to "off" normal, making the rotor free to turn. An impulse is also directed to solenoid SL, which closes the lamp lighting switch for the symbol lamp leaving home plate toward first base. In parallel with solenoid SL is solenoid SM of the relay unit. Solenoid SM operates to open the feeder circuit to contact spring 210, rendering the operating keys Y and C inoperative, however, the same operation of solenoid SM closes the motor circuit. The motor drives the rotor one quarter revolution, whereupon the extended stop latch, set out by solenoid SX, engages, makes and breaks contacts CM which sends an impulse to solenoid SP in the relay unit. Solenoid SP operates the switch which cuts the motor out of circuit and makes connection to the interlocking contact spring 210, thus connecting the keys Y and C for operation once again. After breaking contact CM, the extended stop latch mentioned, engages the stop trigger, stopping the rotor and base runners' lamps in correct position regardless of the coast of the motor, the drive belt slipping to compensate.

Supposing the next play to drive a ball into a home run stall, where the ball operates a C4 contact as it passes through the outlet. Following the arrow on the upper spring of contact C4, Fig. 17, the circuit of the impulse may be traced to relay S4 which operates sending an impulse over two circuits. One impulse is sent to the SH solenoid of the rotor unit, which operates the trigger 112 to release the stop latch it is holding, without throwing said stop latch to normal. The other impulse is directed to the SL solenoid, which lights the base runner's lamp leaving home plate for its run around the bases. Solenoid SM, of the relay unit, is in parallel with SL and, therefore, operates, drawing its armature to close the circuit to the motor and to open the feeder circuit to the interlock contact spring 210. The motor then drives the rotor one complete revolution or until the extended stop latch, released by the trigger 112, completes one revolution with the rotor and makes and breaks contact CM, just before engaging the trigger 112 once more. The impulse from the contact just made at CM operates solenoid SP on the relay unit forcing the armature to open the circuit to the motor and close the interlock feeder circuit to contact spring 210.

The play just preceding to the home run was a one base hit, therefore, there was a lighted base runner lamp on first base when the home running lamp started from home. Therefore, this particular play caused the lighted lamp at first base to continue from first base, leading the lamp starting from home plate around the bases by a distance of one base. Just before reaching home plate position for switches, the extended switch plunger, controlling the leading running lamp, was engaged by the toggle 132, (Fig. 7) thus extinguishing the lamp when it reached home plate. However, the rotor has completed only three quarters of its revolution, therefore, the lamp just extinguished travels on to first base position unlighted and unseen while the lighted lamp enacting the home run, continues home from third base, where it too is extinguished in the same manner as the one preceding it.

The completed play just described has caused the toggle 132, Fig. 7, to act twice, due to its successive engagements with the two extended switch plungers, which control the two lamps representing base runners who have just completed their runs. Each of the two movements of the toggle 132 forced the heel 133, Fig. 7, of the toggle to momentarily close the spring contact CR. The two consecutive impulses thus sent out by the contact CR may be traced on Fig. 17, beginning in the direction indicated by the arrowhead on the upper spring of contact CR, tracing across, upward and across the wiper of the forwarding switch, which is on contact with solenoid SG which controls the first half of the first inning dial and also on contact with the solenoid ST, which controls the total runs dial in the corresponding upper frame. The two consecutive impulses have, therefore, caused two runs to be registered in the proper half inning frame of the box score board and the same two runs to be also registered on the proper total register. The impulses caused by the make and break of the contact CR are also directed through the single stroke bell 211, which is in parallel with the score board circuit.

A two or three base hit is set up by contacts C2 and C3 respectively. The circuits of the resulting impulses being identical to those for a one base hit excepting the circuits to the solenoids SX, SY and SZ which operate singly to set out differ-

ent stop latches on the rotor disc 102 thus governing the distance of travel of the rotor.

Fig. 17 shows the solenoids SX, SY and SZ to one side of the rotor to avoid complication of the wiring diagram, however, they are mounted, as previously described, in opposition to the stop latch positions on the rotor 102 (Fig. 17) marked X. The position XX is the point where extended stop latches are engaged and held by the trigger 112. The solenoids SA, SB and SC are also located behind the rotor in opposition to the first, second and third base switch plunger positions, shown 104, 105 and 106 on the rotor Fig. 17. The switch 103 is then for the moment, in home position for switch plungers. The extension of a rotor stop latch opposite solenoid SX permits only a quarter turn of the rotor in a counter-clockwise direction before the stop latch thus extended is engaged and stopped by the trigger at point XX, Fig. 17. Solenoid SY sets a stop latch on the rotor a half revolution away from the stop trigger and solenoid SZ controls the stop latch position in which a latch is set to permit a three quarter revolution of the rotor in a counter-clockwise direction to point XX.

Succeeding plays will advance the symbol lamps placed on bases by preceding plays during the same half inning.

A tracing of the circuits involved in a sacrifice hit play will complete the description of the playing circuits which originate from the relay unit. The play is set up primarily by a ball making and breaking contact CS which in turn causes the relay solenoid ST to make and break five circuits. Beginning with the upper contact shown above solenoid ST, an impulse is directed to the "out" relay solenoid SO, which operates to record the "Out". The next relay contact below the one just mentioned, operates the rotor unit solenoid SX, which sets a stop latch to govern the distance the rotor shall revolve, which is one base or a quarter turn. The next relay contact operates solenoid SS, setting up the first base "put out" or "kick off" cam 150, described in Figs. 8, 9, 10 and 11. The next contact operates solenoid SR which operates the stop latch release trigger 111. The bottom relay contact leads to the lamp lighting solenoid SL and to the motor starting solenoid SM in the relay unit. The result of the operations of solenoids SL and SM have been previously described. The rotor then revolves. The lamp running toward first base is extinguished just before reaching the base by the action of the cam 150 engaging the switch plunger controlling that particular lamp. The rotor is stopped after a quarter turn as in the case of a one base hit but this play does not permit a lighted lamp, designating a man on first base.

However, any lamps designating men on bases before the play was set up are advanced one base by a sacrifice hit play unless the play should be a third out, in which case all base lamps are automatically extinguished through the action of a cam 172 on the "out" relay cam wheel making and breaking contacts CA, CB and CC which connect with solenoids SA, SB and SC respectively, which in turn throw the base lamp switch plungers to "off" position. Cam 172 also makes and breaks contact CI which sends an impulse to solenoid SI which operates to set the wiper 206 on the next pair of score board contacts to register the next inning in the proper frame.

The mechanism of the forwarding switch has been previously explained. The wiper advances one pair of contacts each half inning, due to the impulses received by its operating solenoid SI, from the relay contact CI at each third out. In Fig. 17 the wiper 206 is in number one position, which connects the run register contact CR through to the solenoid SG1 to score the first half of the first inning and to the corresponding total register solenoid ST. At the close of the game, the wiper 206 passes counter-clockwise from the tenth pair of contacts onto the first pair, in which position it is shown in Fig. 17. As the wiper passes from tenth to number one position, the one elongated ratchet tooth 208 depresses the combination detent-contact spring sufficiently to "make" contact CJ, which sends an impulse down to the master switch solenoid MS drawing its plunger from the depressed CMS contact spring, thus opening the master switch and rendering the game inoperative until properly reopened as described at the beginning of this specification.

An additional attraction may be provided in the form of a duplicate recording field, mechanically unattached to a complete game machine, which can be placed in a display window or other prominent location and there operate electrically, by remote control and in parallel with the recording field of the complete machine. The installation of a duplicate recording field would be optional and being a duplicate of the recording field attached to the machine the duplicate need not be mentioned further.

I claim:—

1. In an automatic base ball game apparatus, a playing field over which balls may be moved; a bat swingably mounted in said field; means for projecting a ball toward the bat; means for swinging the bat; manually controlled means for manipulating said projecting and batting means; means for automatically rendering the batting means inoperative as the projecting apparatus is actuated; and means for rendering the projecting means inoperative as the batting means is actuated, thereby forming an automatic interlock to compel actuation of the projecting and batting apparatus alternately.

2. In an automatic base ball game apparatus, a playing field over which balls may be moved; a bat swingably mounted in said field; magnetically actuated means for projecting a ball toward the bat; magnetically actuated means for swinging the bat; manually controlled circuits for manipulating said projecting and batting means, said circuit including a pair of circuit contacts respectively accessible to the operators; means for automatically breaking the circuit between the manual contacts and the projecting apparatus while connecting the circuit between the batting apparatus and manual contacts each time the projecting apparatus is actuated; and means for breaking the circuit between the manual contacts and the batting apparatus and for connecting the circuit between the projecting apparatus and the manual contacts after each operation of the batting apparatus, thereby forming an automatic interlock to compel the operators to actuate the projecting and batting apparatus alternately.

3. In an automatic base ball game apparatus, a playing field over which balls may be moved; a bat swingably mounted in the field; a ball collecting tray below the field into which the balls from the field drop; a ball elevating tube extending from the tray to the playing field, an opening in the side of the tube opposite the tray; a plunger in said tube having its upper end nor-

mally disposed at the level of the tray upon which a ball entering the opening rests, magnetic means for operating the plunger to force the ball upwardly into the tube; means in the tube above the opening adapted to retain ball so elevated; and yieldable means at the upper end of the tube actuated by each actuation of the plunger for projecting the uppermost ball across the field.

4. In an automatic base ball game apparatus, a playing field over which balls may be moved; a bat swingably mounted in the field; a ball collecting tray below the field into which the balls from the field drop; a ball elevating tube extending from the tray to the playing field, an opening in the side of the tube opposite the tray, a magnetically actuated plunger in said tube having its upper end normally disposed at the level of the tray upon which a ball entering the opening rests, an electrical circuit for operating the plunger magnet; manually controlled contacts for closing the magnet circuit to force the ball on the plunger upwardly into the tube; detents in the tube above the opening adapted to retain ball so elevated; and means for automatically and quickly breaking the magnetic circuit when closed to permit the plunger to drop quickly to normal elevation.

5. In an automatic base ball game apparatus, a playing field over which balls may be moved, a ball elevating tube extending upwardly with its muzzle disposed in the surface of the field, means for elevating the ball through the tube; a spring clip having its free end extending across the muzzle and adapted to impel a ball ejected from the muzzle across the surface of the playing field in the direction of home plate position, said spring clip being adapted to snap back in place after a ball has been ejected and thereby prevent a following ball from being ejected from the muzzle.

6. In an automatic base ball game apparatus, a playing field over which balls may be moved, a ball elevating tube extending upwardly with its muzzle disposed in the surface of the field, a spring clip having its free end extended across the muzzle of the tube, a spring hinged lid disposed substantially flush with the surface of the playing field to provide a covering over the spring clip and muzzle of the tube, said lid having flanges on its sides adapted to assist in properly guiding the balls ejected from beneath the lid when forced open by the impulses to eject the balls.

7. In an automatic base ball game apparatus, a playing field over which balls may be moved, a swingable bat; an electrical circuit including a magnet for magnetically operating the bat; means for projecting a ball towards the bat, the bat being adapted to swing across the path of the projected ball; a circuit breaker in the circuit adapted to break the circuit at the completion of the swing of the bat, and a spring for quickly retracting the bat when the circuit is broken.

8. In an automatic base ball game apparatus, a playing field over which balls may be moved; a a series of stalls around the outfield sector of the field, an additional stall behind the catcher's box position on the field, outlets provided in the bottom of the stalls for the removal of balls therefrom, a yieldable electrical contact across each outlet, a recording field, electrical circuits extending from the recording field and including said contacts, said contacts making and breaking the respective circuits by passage of the balls through the related outlets; a collecting tray beneath the playing field for receiving the balls; and means for returning the balls from the tray to the playing field.

9. In an automatic base ball game apparatus, a horizontal playing field over which balls may be moved, stalls arranged on the playing field having outlets, a pair of yieldable electrical contacts arranged across the outlets; a recording field, electrical circuits extending from the recording field and including the contacts, said contacts controlling their respective circuits and making and breaking same by the passage of balls through said outlets; a collecting tray beneath the playing field receiving the balls passing through the outlets and means for returning the balls from the tray to the playing field.

10. In an automatic base ball game apparatus, the combination of a playing field over which balls may be moved, stalls arranged on the playing field into which the balls may be batted, said stalls having plays respectively noted thereon; manually controlled means for batting the balls; a recording field having a diamond; movable members associated with the diamond; and electrically operated means whereby the enactment of the particular play noted upon the stall into which a ball enters may be visualized upon the recording field through the medium of movable members undergoing base to base advancement of the base running players around the diamond of the recording field.

11. In an automatic base ball game apparatus as set forth in claim 10, said recording field having translucent bases and base lines, and said electrically operated means including a frame rotatably mounted behind the recording field; electric lamps carried by the frame adapted to reflect through the bases and base lines as the frame is rotated according to the various plays made, signifying players running the bases.

12. In an automatic base ball game apparatus, a playing field, a recording field having translucent bases and base lines, a frame rotatably mounted behind the recording field; electric lamps carried by the frame adapted to reflect through the bases and base lines as the frame is rotated according to the various plays made on the playing field signifying players running the bases, apertures in the recording field, and dials mounted behind the apertures for registering the box score; and automatic means for electrically controlling the operation of the rotatable frame and dials by the various plays enacted on the playing field.

13. In an automatic base ball game apparatus, a recording field panel having displayed thereon a base ball diamond with translucent bases and base lines; a rotatable hub disposed behind the panel substantially centrally of the base positions, electric lamps mounted radially of the hub adapted to shine through the bases and base lines, a shaft carrying said hub, a pair of slip rings mounted on said shaft electrically connected with said lamps, and means for controlling the rotation of the hub and the lighting of the lamps; said hub and slip rings rotating with the shaft as a unit.

14. In an automatic base ball game apparatus, a playing field, a translucent recording field panel, a rotary unit including lamps mounted behind the recording field panel to symbolize base running players, said rotary unit including a disk, stop latch plungers mounted on said disk,

magnetic means for operating the plungers located on the disk, and means controlled by the enactment of a play on the playing field for actuating the magnetic means to actuate the plungers in various combinations to permit the rotary unit to revolve a quarter, half, three quarter or complete revolution according to the play enacted.

15. In an automatic base ball game apparatus, a playing field, a recording field panel, a rotary unit including lamps mounted behind the recording field panel to symbolize base running players, said rotary unit including a disk, lamp switches for the lamps mounted on said disk, means adapted to light or extinguish any particular base running lamp at specific progressive points in the revolution of the disk, and magnetically actuated means located on the disk adapted to actuate the lamp switches to control the lighting and extinguishing of the lamps.

16. In an automatic base ball game apparatus, a playing field, a recording field panel, a rotary unit including lamps mounted behind the recording field panel to symbolize base running players, a disk included in said rotary unit, a motor for driving said unit, lamp switches mounted on said disk to control the lighting and extinguishing of the base running lamps, stop latches mounted on said disk adapted to control the arc of rotation of the unit, magnetically operated means associated with the disk to operate the lamp switches and stop latches at specific points in the revolution of the disk, a recording field, an electrical circuit for the recording field, a contact in said circuit adapted to be made by the switches at a specific point in "on" position to cause an impulse to be sent to the rotary unit, a second circuit including a motor cut-off relay; and a second contact in said second circuit adapted to be engaged by the latches near the "stop" position, and when closed causing an impulse to be sent to the motor cut-off relay thereby shutting off the motor.

17. In an automatic base ball ball game apparatus the combination of a playing field upon which plays are adapted to be enacted, a recording field resembling a miniature base ball diamond, means for automatically advancing electrical lamps around the bases of the recording field electrically interlocked with the playing field to record the plays, a master switch, a manual control for operating the playing field, coin actuated devices associated with the manual control, means normally disconnecting the electrical circuit rendering the apparatus inoperative against manual control, and means whereby the depositing of a coin in the coin actuated devices will unlock the master switch and render the machine operative.

18. In an automatic base ball game apparatus, a playing field, a recording field panel upon which the advancing runs around the bases are depicted; said recording panel having an inning score, total score, and "Outs" recorders, control magnets for automatically controlling said recorders; a rotary unit behind the recording field carrying lamps, control magnets for said rotary unit, primary circuits for conducting impulses from the playing field to relays disposed behind the recording field panel, each of said relays being arranged to be operated singly and to forward impulses over various combinations of circuits to the rotary unit control magnets and inning score control magnets which manipulate their respective apparatus to register various plays; a drive motor for the rotary unit, means for magnetically starting and stopping the drive motor at the beginning and end of each required turn of the rotating unit; means for automatically switching electrical impulse from the run recorders to the advanced inning score and total recorders corresponding to the half inning being played, means for automatically and magnetically recording the "Outs", means for extinguishing the lighted symbol lamps on the rotary unit at the close of each inning, means for advancing the score recorder to the next half inning and proper total register after each third out, means to advance the score recording circuit to the connections leading to the first half of the first inning and total register at the close of the game; and means for automatically disconnecting the drive motor rendering the game inoperative after the close of the last half of the last inning on the inning score recorder.

19. In an automatic base ball game apparatus, a recording field resembling a miniature base ball diamond having bases and base lines, electric lamps associated with the diamond, and means for automatically advancing lighted electric lamps around the bases of said recording field diamond.

20. In an automatic base ball game apparatus, a playing field resembling a miniature base ball diamond over which balls may be rolled, a recording field diamond having bases and base lines; and means for advancing lighted electric lamps around the base lines of the recording field in accordance with the plays designated on the playing field, said means automatically lighting and extinguishing the lamps.

21. In an automatic base ball game apparatus, horizontal playing field diamond over which balls may be moved, a series of stalls around the outfield sector of the playing field, an additional stall behind the catcher's box position on the playing field, outlets provided in the bottom of the stalls for the removal of balls therefrom, electrical contacts in the outlets adapted to be closed by the passage of a ball therethrough, a rotor unit, a recording field diamond adjacent the unit, a system of relays, an electrical circuit including the relays and electrical contacts whereby when a contact is closed an electrical impulse will be directed to one of the relays and magnetically actuate the rotor unit whereby the rotor will be caused to rotate and enact a base ball maneuver through the medium of lighted electric lamps traveling between bases of the recording field diamond.

22. In an automatic base ball game apparatus, a playing field, a recording field representing a miniature base ball diamond, an inning score recorder, a rotary unit including base running lamps mounted adjacent the recording field and adapted to place said lamps opposite the base locations of the recording field when the rotary unit is in "stop" position; means on said rotary unit adapted to control the lighting and extinguishing of the lamps, stop members mounted on said rotary unit adapted to control the arc of rotation of the unit, electromagnetically operated means associated with the rotary unit to operate the lamp lighting means and stop members at specific points in their revolution with the rotary unit, an electrical circuit connecting the rotary unit and said inning score recorder, contacts in said circuit adapted to be made and broken by the lamp lighting means when in "on" position as the rotary unit revolves to a specific point whereby electrical impulses will be sent to the inning score recorder, a motor cut-off relay; a second circuit including the motor cut-off relay,

and a second contact in said second circuit adapted to be made and broken by any stop member when rotating to a specific point with the rotor unit, said impulse operating the motor cut-off relay.

23. In an automatic base ball game, a playing field over which balls may be moved, stalls arranged on the playing field into which balls may be batted and having regulation base ball plays designated on each stall, outlets provided in the stalls for the removal of balls therefrom, electrical contacts in each outlet, a relay unit, an electrical circuit connecting the contacts and said relay, an electromagnetically operated inning score recording unit, an electromagnetically operated "out" recording unit, a recording field diamond having bases and base lines, a rotor unit, electric lamps mounted on said rotor unit behind the bases on the recording field diamond when the rotor unit is in "stop" position, electromagnetic means for manipulating the lighting and extinguishing of the lamps through automatic remote control from the relay unit, a motor for rotating the rotor unit to advance the lamps from base to base around the recording field diamond, electromagnetic means to actuate the starting and stopping of the motor and to govern the arc of travel of the lamps by automatic remote control from the relay unit, an electrical circuit extending from the inning score recording unit, a second contact in said circuit, means to make and break said electrical circuit to send an impulse to the inning score recorder for each lighted lamp rotating to home plate position on the recording field diamond, a motor cut-off relay; a second electrical circuit extending from the motor cut-off relay, a third contact in said second circuit, means to make and break said third contact to send an electrical impulse to the motor cut-off relay as each arc of rotation of the lamps is completed, a third electrical circuit extending from the first mentioned contacts below the stalls designated "Out" to the electromagnetic drive of the "Out" recorder, and means for extinguishing all lamps in alignment with bases on the recording field diamond when three "Outs" are designated on the out recorder.

24. In an automatic base ball game, a recording field diamond on which the movement of imaginary players are depicted; electric lamps associated with said field; and means for lighting, extinguishing and moving the lamps between the bases of the recording field diamond, said lamps being remotely controlled electromagnetically.

25. In an automatic base ball game apparatus, an inning score recording unit, a numeral dial for each half inning, a pair of numeral dials for the two run total registers of the unit, means for holding the dials at any point to which they have been rotated, electromagnetic means for rotating the dials ahead one numeral each electrical impulse, electromagnetic means for rotating each half inning dial progressively and independently of the other half inning dial, automatic electromagnetic means shifting the electrical impulses to the next following half inning score dial upon each recording of three "Outs" on the "Out" recorder, means for electromagnetically operating the total score recording dials alternately in conjunction with the half inning dials, a master switch, a circuit including said switch, and means for directing an electrical impulse over said circuit to open the master switch at the moment the third "Out" of the last half inning is recorded on the "Out" recorder.

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