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Waller

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[54] **BASEBALL PROPELLING MACHINE WITH SEQUENTIAL INDICATOR LIGHTS**

[76] Inventor: **James C. Waller,** Box 1121, Brookings, Oreg. 97415

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[21] Appl. No.: **492,000**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 284,231, Aug. 28, 1972, abandoned.

[52] **U.S. Cl.** ..... **124/11 R;** 124/30 R; 273/26 D; 340/309.4; 340/323; 124/50

[51] **Int. Cl.²** **F41F 1/04;** G08B 5/38

[58] **Field of Search** ..... 124/1, 11 R, 30 R; 46/74 B, 74 C; 58/145 A; 273/1.5 A, 26 D, 86 B; 340/309.4, 323

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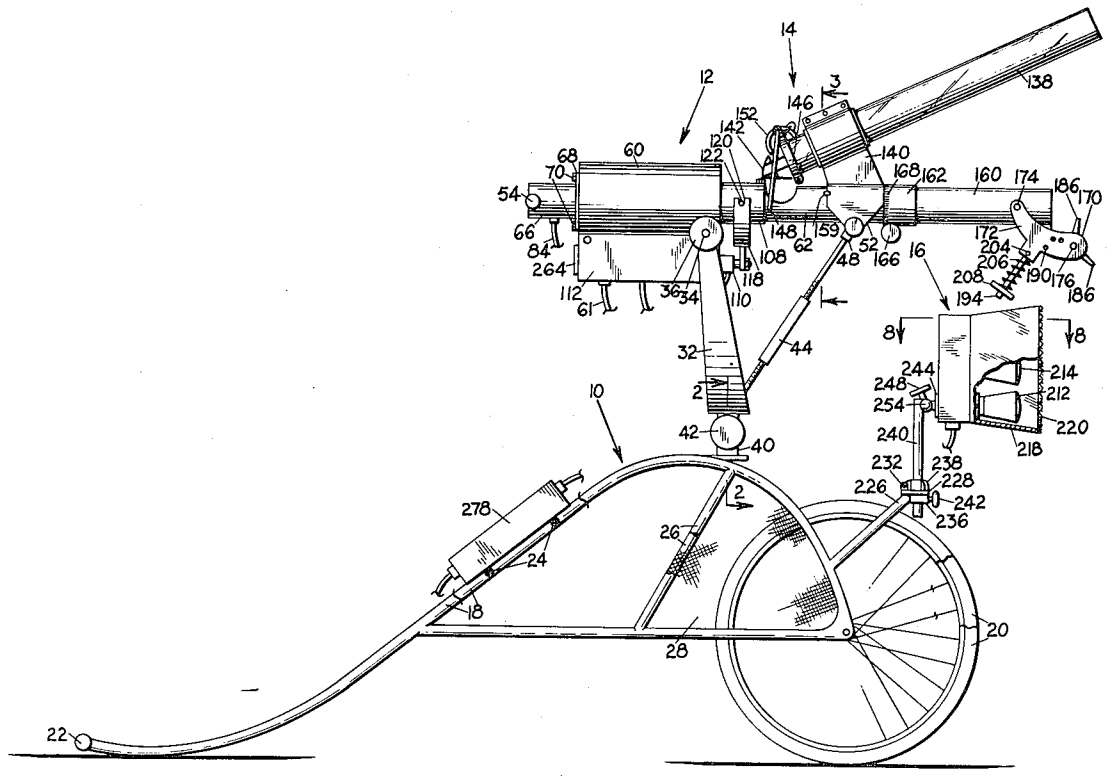
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Primary Examiner—Richard C. Pinkham
Assistant Examiner—R. T. Stouffer
Attorney, Agent, or Firm—Eugene M. Eckelman

[57] **ABSTRACT**

A baseball propelling machine employing a wheeled frame, a pressure chamber and barrel, a ball receptacle or magazine, and a bank of count-down indicator lights. The wheeled frame includes handle bars which facilitate easy maneuverability of the machine. The pressure chamber and barrel includes a novel arrangement of pressure chamber and internally operating firing cylinder, the latter movably operating on a stationary piston for controlling the firing functions. The barrel supports the ball receptacle and includes a magazine associated with the ball receptacle for automatically feeding balls to the barrel. An outer end portion of the barrel is rotatably adjustable and carries a curve control mechanism for applying various curves or other actions to baseballs leaving the barrel. The bank of count-down indicator lights includes three bulbs operated in sequence by a control mechanism which indicate ready, set and fire positions, respectively. A control for the machine allows it to be operated in its sequence of ready, set, and fire in automatic, semi-automatic, or manual operations, and furthermore such control includes a device for remotely operating the machine.

11 Claims, 10 Drawing Figures



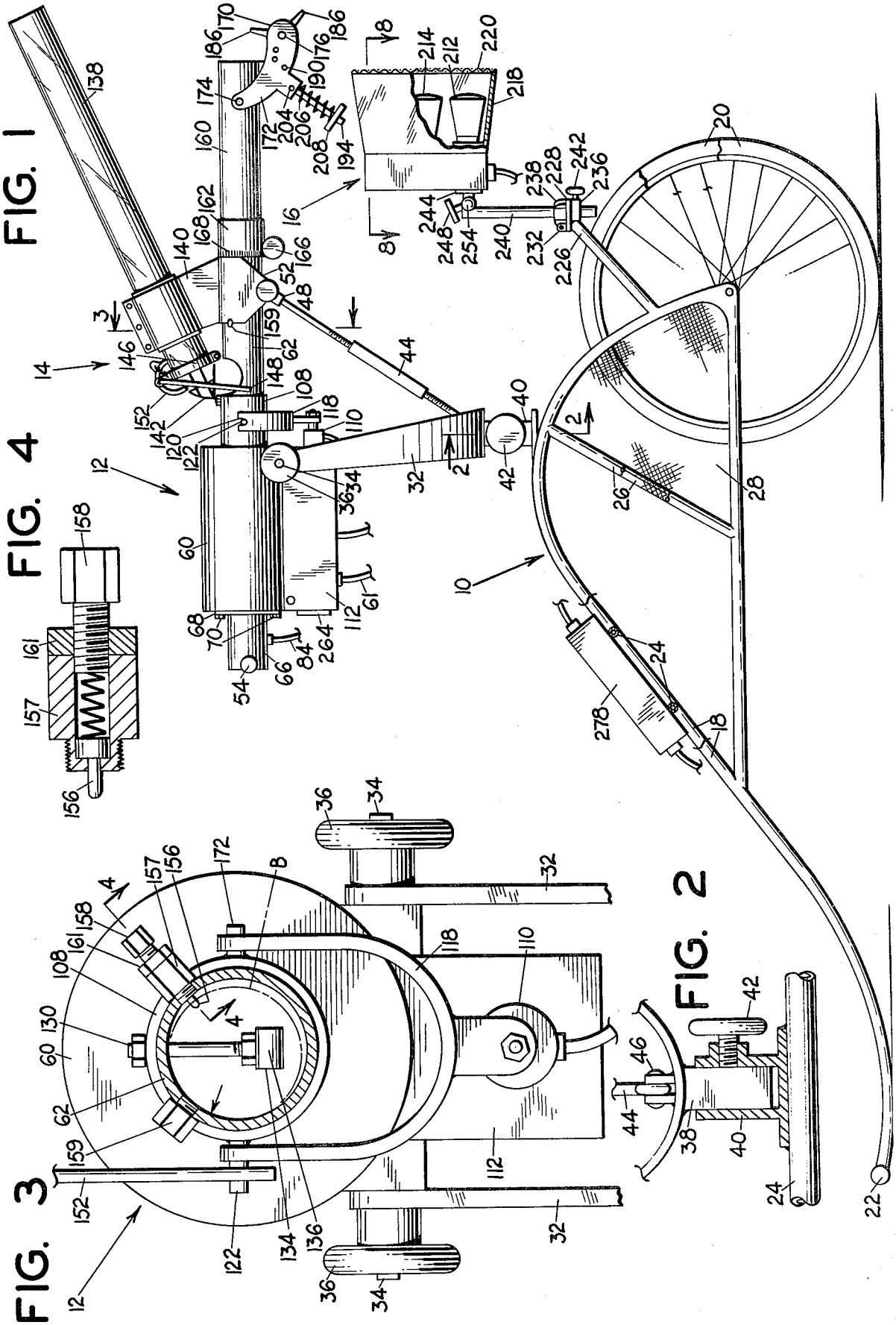


FIG. 1

FIG. 4

FIG. 3

FIG. 2

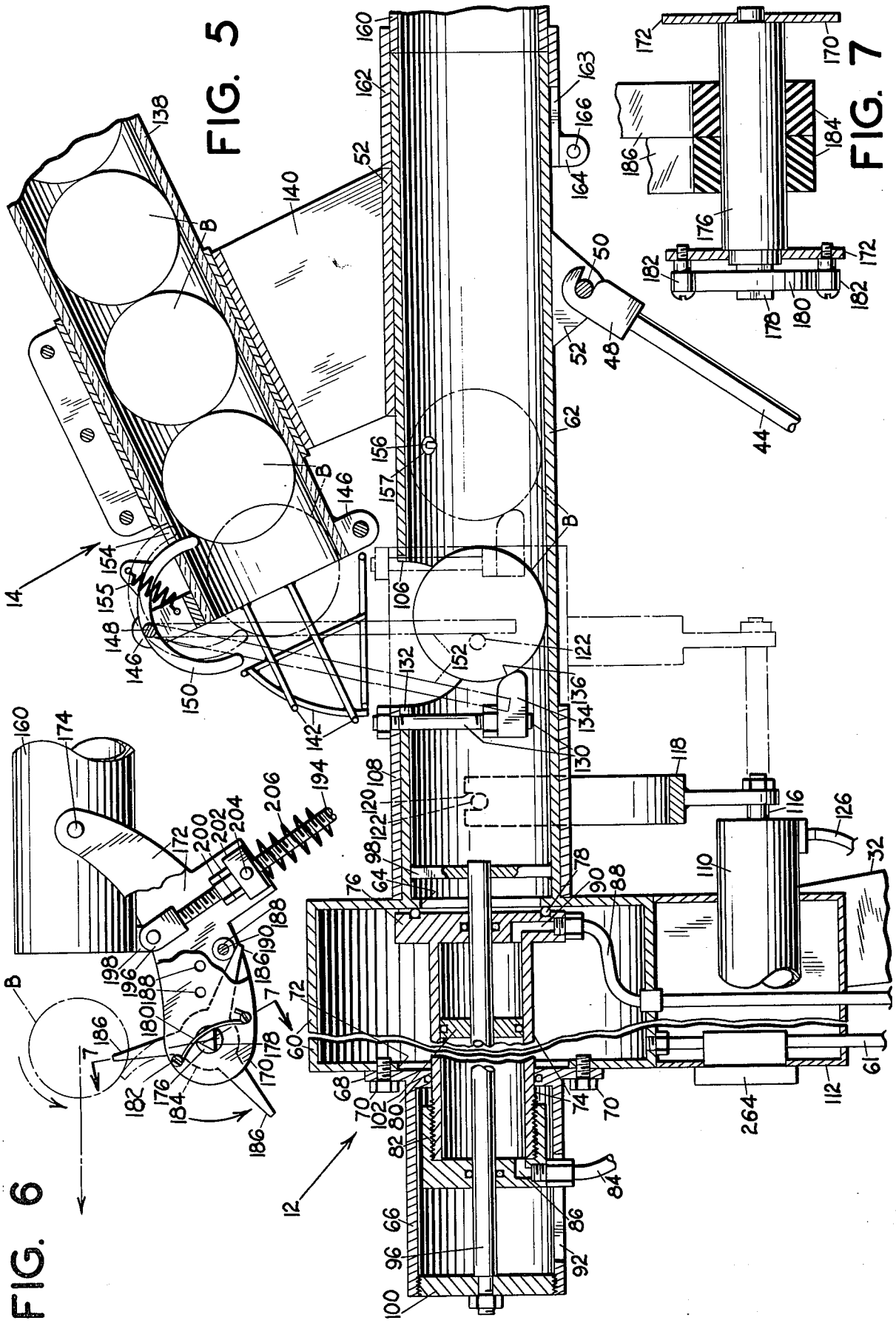


FIG. 5

FIG. 6

FIG. 7

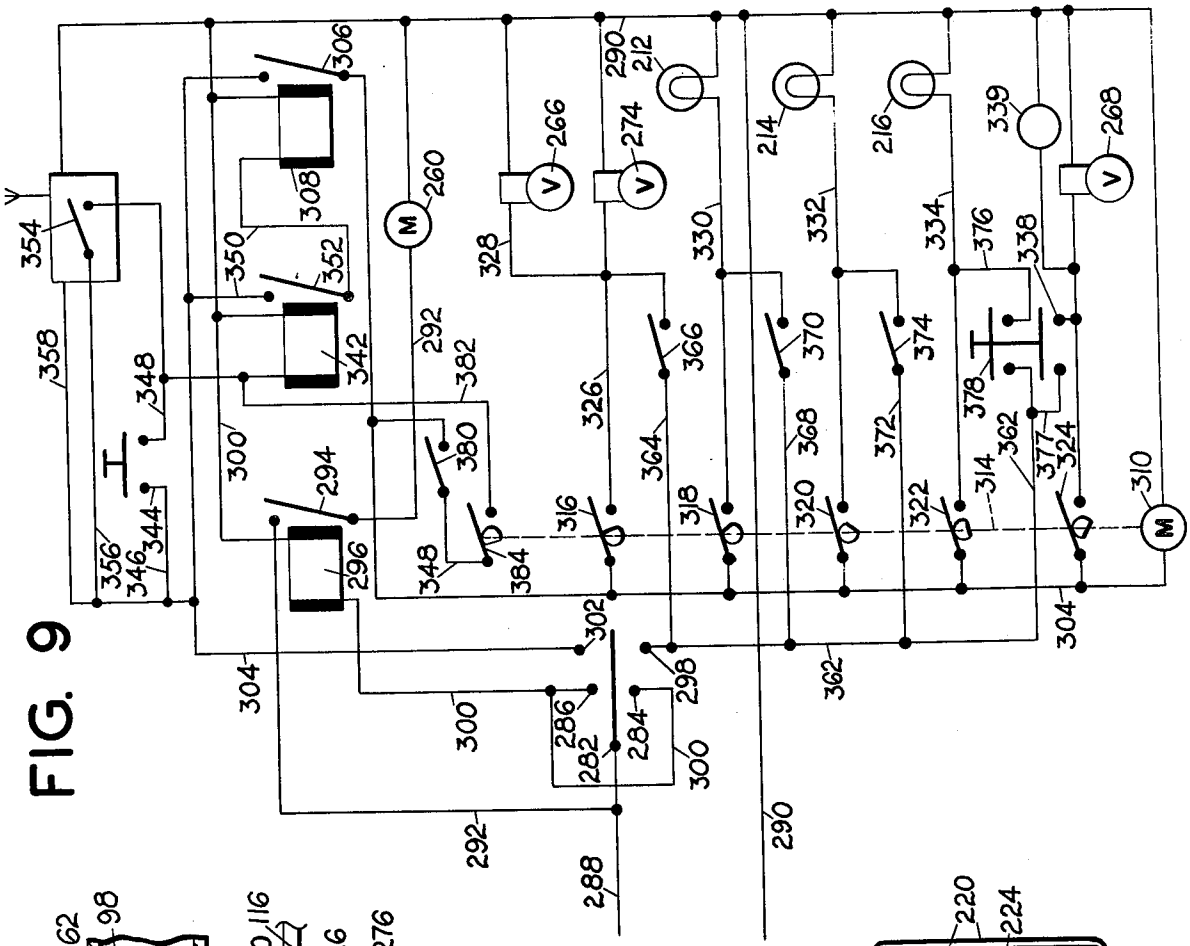


FIG. 9

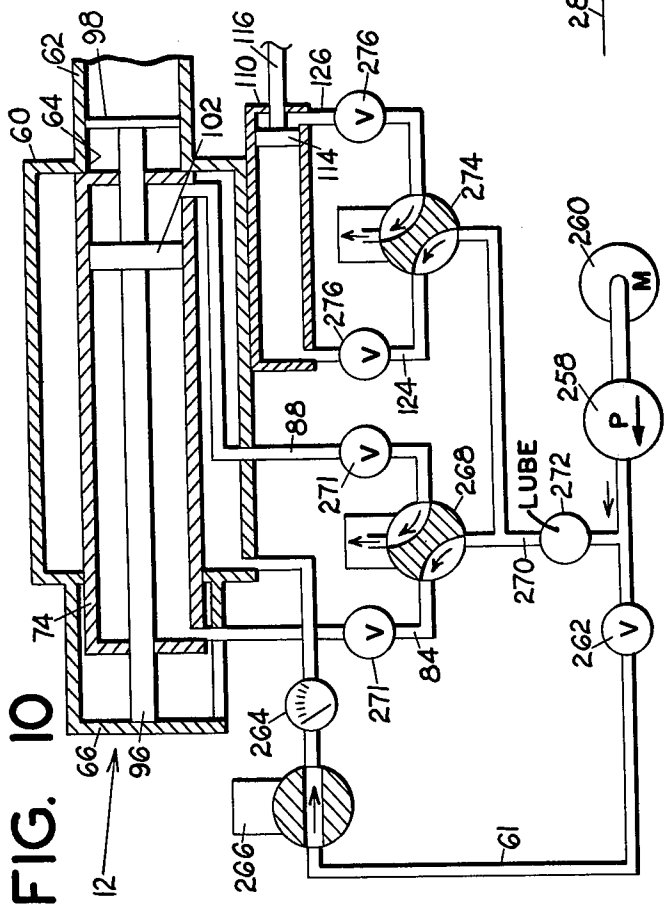


FIG. 10

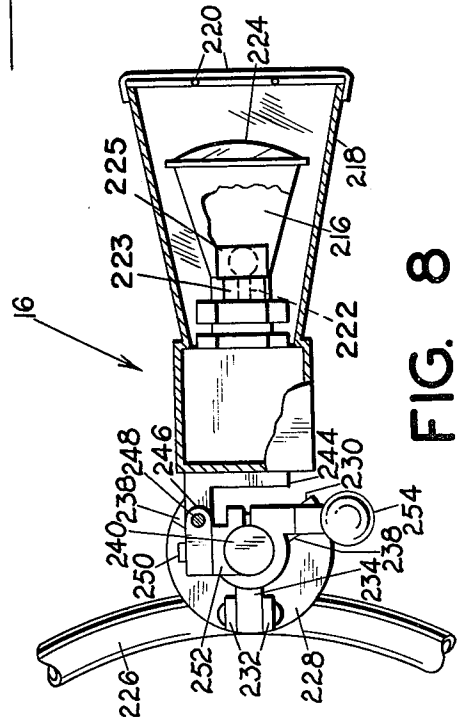


FIG. 8

BASEBALL PROPELLING MACHINE WITH SEQUENTIAL INDICATOR LIGHTS

REFERENCE TO PRIOR APPLICATIONS

This is a continuation-in-part of application Ser. No. **284,231,** filed Aug. **28, 1972** for Baseball Propelling Machine, now abandoned.

BACKGROUND OF THE INVENTION

This invention relates to new and useful improvements in machines of the type capable of shooting baseballs to assist in practice batting and fielding.

Baseball propelling machines have heretofore been provided such as for example those illustrated in U.S. Pat. Nos. **2,634,717, 3,018,769** and **3,308,802.** These machines, however, have disadvantages. For example, they are difficult to set up in the field, either requiring a base support or manual assembly in the field, Furthermore, while some of the machines have visible indicators to designate when the ball is to be propelled, such indicators are not satisfactory. Also, the prior machines fail to provide mechanism which can apply desired actions to a baseball, such as sliders, curves, and the like. Further, some of the machines of the prior art are complex in construction and thus overly expensive to manufacture.

SUMMARY OF THE INVENTION

According to the present invention and forming a primary objective thereof, the present invention provides a baseball propelling machine which overcomes the disadvantages of prior machines.

More particular objects of the present invention are to provide a baseball propelling machine which is supported on a wheeled frame of a type facilitating convenient transporting onto and maneuverability of a field; which employs novel indicator means easily seen by the batter or fielder; which has a novel curve control mechanism for applying various actions to the baseballs, and which is simplified in construction and easy to manufacture.

The invention will be better understood and additional objects and advantages will become apparent from the following description taken in connection with the accompanying drawings which illustrate a preferred form of the device.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a side elevational view of the present baseball propelling machine;

FIG. **2** is an enlarged fragmentary sectional view taken on the line **2—2** of FIG. **1**;

FIG. **3** is an enlarged fragmentary sectional view taken on the line **3—3** of FIG. **1**;

FIG. **4** is an enlarged fragmentary sectional view taken on the line **4—4** of FIG. **3**;

FIG. **5** is a foreshortened fragmentary sectional view taken vertically through the pressure chamber and barrel of the machine;

FIG. **6** is an enlarged side elevational view, partly broken away, of curve control mechanism utilized with the invention;

FIG. **7** is an enlarged sectional view taken on line **7—7** of FIG. **6**;

FIG. **8** is an enlarged sectional view taken on the line **8—8** of FIG. **1** showing count-down indicator means;

FIG. **9** is a wiring diagram showing operating control means for the present machine; and

FIG. **10** is a piping diagram of air operating means.

DETAILED DESCRIPTION OF A PREFERRED EMBODIMENT

With reference to FIG. **1,** the present invention comprises generally a support frame **10,** a pressure chamber and barrel assembly **12,** a ball feeder or magazine **14,** and a reflex trainer assembly **16.**

The support frame **10** includes a pair of longitudinal frame members **18** shaped as shown in FIG. **1** and supported at their forward ends on a pair of bicycle-type wheels **20.** Such large wheels provide easy transporting of the machine onto and off the field. The longitudinal frame members **18** converge rearwardly and are secured to a transversely extending handle **22.** Frame members **18** curve upwardly a slight amount just forwardly of the handle **22** so that the latter is easy to grasp. The support frame **10** may have suitable cross frame members **24** and side frame members **26.** A front portion of support frame is provided with netting **28** on side portions and at the bottom to form a storage compartment for various articles such as baseballs, mitts or the like.

The pressure chamber and barrel assembly **12** is supported on the frame **10** by means of an upstanding yoke **32** the upper ends of which straddle the sides of the assembly **12** and are rotatably engaged with laterally extending stub shafts **34.** Stub shafts **34** have nuts **36** thereon which upon being tightened are capable of holding the assembly **12** in a fixed position. The bottom end of the yoke, best seen in FIG. **2,** has an integral depending projection **38** fitted in a socket **40** integrated with a cross frame member **24.** A setscrew **42** in the socket **40** is engageable with the projection **38** to anchor the yoke **32** securely in place.

A turnbuckle **44** has a pivot connection **46,** FIG. **2,** with the bottom of yoke **32** and has a hook **48,** FIG. **5,** at its upper end engageable with a clamp screw **50** on a bracket **52** on the pressure chamber and barrel assembly. The turnbuckle **44** secures the pressure chamber and barrel assembly in a set position, and by adjusting the length of the turnbuckle the assembly **12** may be angled as desired. Also, if it is desired that the pressure chamber and barrel assembly be operated freely for up and down movement, the turnbuckle **44** may be disengaged from the clamp screw **50** and the nuts **36** loosened. This allows an operator to grasp handles **54** secured on the pressure chamber and barrel assembly **12** and manipulate the latter as desired. Furthermore, setscrew **42** may be loosened to allow pivotal movement of the assembly **12** on a vertical axis. With the turnbuckle **44** secured to the barrel assembly and the nuts **36** and **42** tightened, lateral positioning of the machine is readily accomplished by simply turning the frame with its wheels **20.**

The pressure chamber and barrel assembly **12** includes a pressure chamber **60,** best seen in FIG. **5** and **10,** from which a barrel **62** projects integrally, these two portions being in communication by an enlarged port **64** therebetween. Mounted on the rearward side of chamber **60** is a housing **66.** This housing has an outer peripheral flange **68** at its forward end by means of which it is attached to the chamber **60** by screws **70.** The rearward wall of the chamber **60** has an opening **72.** The connection between the housing **66** and the

chamber 60 comprises an airtight connection. Movably disposed in the chamber 60 and also extending into the housing 66 is a firing air cylinder 74 provided with a front wall or head 76 having abutting engagement with the inner surface of the front wall of the chamber 60. The front surface of wall 76 supports an O-ring 78 which abuts against the inner surface of the chamber 60 to seal off the flow of air between chamber 60 and the barrel 62. The air cylinder 74 extends rearwardly through the opening 72 and has a sliding but sealing engagement with a front wall portion 80 of the housing 66. Cylinder 74 has a removable rear end cap 82. An air line 84 leads into the end cap 82 and communicates with the interior of air cylinder 74 through a port 86. Front wall 76 of the air cylinder 74 has an air line 88 leading thereinto and such line communicates with forward portion of the cylinder by a port 90 in the wall 76. The front line 88 passes through a wall of the chamber 60 in an air tight fit and line 84 passes through a slot 92 in housing 66, the lines 84 and 88 being flexible to allow movement of the cylinder 74, and in addition the line 88 has sufficient excess length within the chamber 60 to allow for such movement.

Extending through the air cylinder 74 is a stationary rod 96. This rod is anchored at its forward end in a cross arm 98 secured in the barrel 62. The rod is secured at its rearward end to a removable end wall 100 of the housing 66. A piston head 102 is supported integrally on the rod 96 within the cylinder 74, and such piston rod has sliding sealing engagement with the inner surface of the cylinder whereby upon the application of air pressure in line 84, the air cylinder is driven to the left and upon the application of air pressure in line 88, the cylinder is driven to the right. As will be more apparent hereinafter, the right hand position of the air cylinder 74 seals the opening 64 between the pressure chamber 60 and the barrel 62 and left hand position of the cylinder allows a charge of air to move from such pressure chamber to the barrel for propelling a ball. Preferably, the cylinder 74 has a small supply of residual oil between the piston head and the rear end cap 82. This oil cushions the forward movement of the cylinder to protect the O-ring 78 and to reduce noise.

The barrel 62 has a ball receiving opening 106 on its top portion disposed a short distance forward of the pressure chamber 60. Such portion of the barrel comprises a magazine portion and is associated with a sleeve member or magazine sleeve 108 slidably mounted on the barrel and arranged in a sliding movement thereof to be retracted from the opening 106 or to cover the opening. Sleeve 108 is operated by an air cylinder 110 supported in parallel relation thereto below the barrel 62 in a housing portion 112 depending integrally from the pressure chamber 60. Cylinder 110 has a piston head 114, FIG. 10, therein connected to a piston rod 116 projecting through the forward end of the cylinder and connected to an upstanding yoke 118 which extends up along opposite sides of the sleeve 108. The upper ends of the yoke have notches 120 engageable with laterally projecting pins secured to the sleeve. Movement of the piston rod 116 outwardly moves the yoke 118 and sleeve 108 in a direction toward the end of the barrel, an outward positioning of such parts being shown in phantom lines in FIG. 5. As best seen in FIG. 10, cylinder 110 has an air line 124 connected to the rearward end thereof for driving the piston head 114 to the right and has an air line 126 entering through a front portion thereof to drive the piston head to the left.

Secured to the sleeve 108 and depending into the barrel 62 is a finger 130, the barrel 62 having a longitudinal slot 132 extending rearwardly from the opening 106 for slidably receiving the finger 132 whereby the latter is movable in one position behind the opening 106 and in the other position is disposed within the area of the opening. The bottom end of the finger 130 carries a forwardly projecting head 134 having a front edge 136 which is tapered vertically from front to rear. Head 134 is disposed in a position to be substantially below the center line of a ball B deposited in the magazine portion of the barrel so that when the sleeve 108 is moved forwardly the head will be able to support the ball off the bottom of the barrel, as will be more fully described hereinafter.

The ball feeder 14 comprises a tubular magazine 138 supported in angled relation on the barrel 62 by means of an upper extension 140 of the bracket 52. The magazine 138 is open at both ends, the rearward end terminating at approximately the forward end of opening 106. The rearward end of the magazine 138 supports integrally a semispherical guide frame 142 open at the bottom and arranged to guide baseballs B from the magazine into the barrel through the opening 106. Also mounted on the rearward end of magazine 138 is a ball feed device comprising a bracket member 146 supporting the transverse shaft 148 to which is secured an inverted U-shaped ball feeder 150 and an actuating finger 152 which extends down one side of the sleeve 108 into the path of one of the pins 122. One end of ball feeder 150 projects behind the magazine 138 and the forward end projects through an opening 154 in the magazine. Ball feeder 150 is urged in a clockwise direction, as viewed in FIG. 5, by a tension spring 155. The structure and arrangement is such that as the ball feeder is tilted to a ball release position by engagement of a pin 122 with finger 152 as shown by the full lines in FIG. 5, it will release a ball for travel to the opening 106 into the barrel 62 and the other end will hold back the remaining baseballs. In the other rotative position of the ball feeder 150, under the action of spring 155 and shown in phantom lines in FIG. 5, it will allow baseballs to move down the magazine the distance of one baseball, with the rearward portion of the ball feeder stopping such travel. By alternate swinging movement of the ball feeder 150 under the action of pins 122 and spring 155, balls are fed one at a time into the barrel 62. The arrangement is such that as the air cylinder 110 operates the sleeve 108 between its retracted and forward positions it causes the ball feeder 150 to release the ball as it retracts.

In the forward position of the sleeve 108, the ball is moved by the head 134 to a set position for firing. To hold the ball in such set position, a spring pressed pin 156 in mounted in the barrel to project a short distance thereinto. This pin is supported in a housing 157, FIG. 4, threadedly mounted in the barrel 62, and its spring engagement with a ball is adjustable by an adjusting screw 158 having a lock nut 161 thereon. The location of the set pin is at an upper, side position, with a threaded opening being provided at the opposite side also. One pin is used at a time. In additon to forming a forward stop for the ball in the barrel, the pins apply right or left-hand action to the ball when it is fired. That is, when a ball is thrown by hand, it is well known that

the action on the ball is different when thrown by a left hander than when thrown by a right hander. The pins by their proper placement in one or the other of their two positions applies the characteristics of a right or left hander. It has been found that when the pin is installed on the left side of the barrel, the characteristics of a right-hand pitch are present and when the pin is installed on the right side of the barrel, the characteristics of a left-hand pitch are present. Since only one pin **156** is used at a time, the mounting hole that is not being used is closed by a plug **159.**

In the act position of the ball for firing, it is urged against the one pin **156** being used and lifted slightly off the bottom of the barrel by the angled surface **136** of the head **134.** The ball thus has three point contact in the barrel for firing, namely, against the pin, on the head **134,** and against the opposite side of the barrel from pin **156.** The inner dimension of the barrel is slightly larger than the diameter of the ball to provide such three point contact. The enlargement of the barrel with relation to the ball also allows free propulsion of the ball therethrough even though the ball may be flattened somewhat by the propelling force. When the ball is fired, the pin **156** retracts against its spring to allow the ball to pass.

Barrel **62** has a front extension **160** mounted thereon by means of a sleeve **162** integrated with the extension **160** and having telescoping relation with the end of the barrel **62.** Sleeve **162** has a bottom longitudinal slot **163** associated with a pair of ears **164** on opposite sides of the slot and engageable by a clamp bolt **166,** such arrangement allowing the sleeve **162** to be securely clamped non-rotatably on the barrel **62** or upon loosening the clamp bolt **166** the sleeve and its associated barrel extension **160** may be rotatably adjusted. Sleeve **162** carries an indexing portion **168** thereon which may be aligned with a stationary member such as bracket **140** so that said sleeve can be selectively adjusted to a rotated positon as desired. Also, for properly positioning the bracket **140** on the barrel **62,** said bracket has a notched engagement with the housing **157** or the plug **159,** thus insuring precise location of the bracket for installation.

Mounted on the end of the barrel extension **160** is a curve control mechanism **170** illustrated in FIGS. **1, 6** and **7.** This mechanism includes a pair of plates **172** pivotally attached at their rearward ends to opposite sides of the barrel extension **160,** as by laterally projecting pins **174.** The front end of plates **172** support a shaft **176.** One end of the shaft **176** projects through its respective side plate **172** and is formed into a triangular shape **178.** Such triangular end of shaft **176** is engageable by a leaf spring **180** anchored at opposite ends by end anchor pins **182** attached to the side plate **172.** Leaf spring **180** engages shaft end **178** and resists rotation of the shaft **176** for a purpose to be described.

Secured on the shaft **176** in integral relation is a pair of hubs **184** having resilient radially extending fingers **186** projecting therefrom. In a preferred arrangement, each of the hubs **184** has three fingers **186,** aligned in pairs, the pair of fingers spreading apart and flexing as the ball passes by them to minimize damage to the ball and of course to the fingers. With the arrangement of the leaf spring and triangular end **178** of the shaft being such that after rotation of the shaft **176** it will stop with one of the fingers disposed upwardly in the path of the barrel extension **160.** The resistance applicable by fingers **186** is adjustable by the turning resistance of shaft **176** controlled partly by the leaf spring **180.** To accomplish further control for the turning resistance of shaft **176,** a plurality of apertures **188** are provided in the side plates **172** which receive a cross pin **190** in a selected one of the apertures. Said apertures are located at different distances from the axis whereby the closer the pin mounting is to the axis of the shaft **176** the more resistance is applied to the turning of the hubs **184.** More particularly, with the pin **190** located in the outermost aperture **188** the flexible fingers can move through the pin rather easily and thus can rotate with the hubs thereof and shaft without a great deal of force applied to the finger in the path of the baseball coming from the barrel. However, as pin **190** is moved inwardly to other apertures **188,** progressively greater resistance is applied to the ball as it leaves the barrel. Such of course gives greater spin to the ball to control the curved applied thereto. The various settings in apertures **188** may also be desirable, depending upon the type of ball used.

The curved control mechanism is held in a set position by a threaded rod **194** having one end thereof attached to a clevise **196** pivotally connected to an ear **198** secured to the barrel extension **160.** Rod **194** passes freely through a nut assembly **200** having an integral enlargement **202** pivotally connected by side pins **204** to the side plates **172.** A compression spring **206** is supported on the rod **194** between the enlargement **202** and an adjusting nut **208,** FIG. **1,** at the outer end of the rod.

By adjustment of the nut **208** on the rod **194,** the curve control mechanism is moved up and down relative to the end of the barrel and such adjustment also alters the resistance that the fingers **186** apply to the propelled ball can be varied. That is, with the nut backed off considerably to decrease the acting force of the spring **206** on the curve control mechanism, the latter can pivot on the pins **174** rather easily to apply a light curve effect to the ball. However, when the nut is adjusted progressively inwardly, the mechanism will not spring back as readily. Thus, the amount of spin applied to the ball is accomplished by the two adjustments, namely by a suitable setting of the pin **190** in apertures **188** and by a suitable setting of the adjusting nut **208.** Further adjustment is accomplished by moving nut **200** on the rod, such adjustment usually however being merely used in initially setting up the curve control mechanism.

In the operation of the present device, the curve control mechanism is set up as desired to apply the desired spin to the ball. In addition, the barrel extension **158** can be rotatably adjusted by loosening clamp bolt **166** and retightening the same to position the curve control mechanism at the bottom to provide a drop on the ball, on the sides to provide various curves, and so on.

The reflex trainer means **16** is shown in FIGS. **1** and **8** and comprises a bank of three lights **212, 214** and **216** mounted in a protective housing **218** having an open front end protected by a wire netting **220.** It is preferred that the lights **212, 214** and **216** utilize a small wattage lamps **222** and magnifying lens **224** in order than small wattage lamps can be used and yet clear visibility thereof is present for the batter. For example, a **6** watt lamp **222** is employed in suitable socket means **223,** and the lens **224** has **3.3X** magnification. The lens may be a plano/convex lens of **73** mmX **92.7**

mm with a focal length of 92.7 mm. The socket means 223 has a covering lens 225 of suitable color. The reflex trainer assembly is supported on a cross frame member 226 extending between side frame members 18. Welded to the frame member 226 is a base plate 228 have a V-shaped cut-out forward portion 230. A pair of upstanding ears 232 are integrally provided on the rear portion of base plate 228. Hingedly connected to ears 232 is an ear 234 integral with an upright collar 236 which in the upright position thereof extends above and below the base plate 228. An upper portion of the collar has a pair of laterally projecting lugs 238 which are arranged to abut on the upper surface of base plate 228 to support collar in its upright position. In other words, the lugs 238 form a limit of rotation for the collar in a clockwise direction but allow the collar to swing back for a reason to be described.

An upstanding post 240 is secured in the collar 236 by a setscrew 242. The rearward end of light housing 218 has a rearwardly extending bracket 244 a portion of which is disposed between a pair of ears of a clamp bracket 246 utilizing a clamp bolt 248. Clamp bolt 248 is supported on a lateral stub shaft 250 on a second clamp bracket 252 mounted on post 240 and utilizing a clamp bolt 254.

By the structure described, the reflex trainer light mechanism is supported on the post 240 for viewing by the batter or fielder in front of the machine. The three lights 216 are operated in sequence to serve as operation indicating means of the machine. If a ball should strike the housing 218 from the front, it can swing back on the pivot connection 232, 234 to sbsorb some of the shock. Also, if it is desired that the light housing be adjusted laterally, such can be accomplished by loosening the clamp bolt 254 and swinging the assembly to a desired position on post 240 and then retightening the clamp bolt. Also, if it is desired to pivotally adjust the light housing vertically, such is accomplished by loosening clamp bolt 248 and pivoting the assembly to the desired position on the stub shaft 250 and then retightening the clamp bolt.

Associated with the present baseball propelling machine is a compressor 258, FIG. 10, for developing the propelling pressure and for operating some of the parts. This compressor is utilized with other structure now to be described to operate the said propelling mechanism and other parts and has suitable drive means therefor. As illustrated herein, such drive means comprises an electric motor 260. Compressor 258 is connected to air chamber 60 by the line 61 in which is incorporated a regulator valve 262 for controlling the balance per square inch charge in the chamber 60. A pressure gauge 264 may also be mounted in line 61 and preferably located at the rear side of the machine for easy visibility by the operator. Line 61 passes through a solenoid operated valve 266 the function of which is to control on and off air flow in the line 61, as will be more apparent hereinafter.

Lines 84 and 88 from the firing cylinder 74 lead into a solenoid operated, double acting valve 268 connected to line 61 by a line 270. Valve 268 is arranged such that in one position, power is applied from the compressor through line 84 and at this time line 88 vents to atmosphere and in the other position of the valve power is applied to line 88 and line 84 vents to atmosphere. Each of lines 84 and 88 has a regulating valve 271 therein to control operating pressure to the firing cylinder 74, and line 270 has a lubricating device 272 of well known structure which automatically lubes moving parts of the valve 268 and firing cylinder 74.

Air lines 124 and 126 from the air cylinder 110 lead into a solenoid operated, double acting valve 274 which is arranged such that in one position thereof power is applied to line 124 and line 126 vents to atmosphere. In the other position of the valve, power is applied to line 126 and line 124 vents to atmosphere. Each of these lines is provided with a regulating valve 276 for controlling the power applied to the cylinder 110.

FIG. 10 shows the parts precisely at firing. In such position, the valve 266 is open and pressure has built up in pressure chamber 60. At the same time, valve 274 has admitted pressure to line 124 so that the piston rod 116 is moved forwardly to close the magazine sleeve 108. As the pressure was building up in the air chamber 60 and the air cylinder 110 was being operated, valve 268 is positioned so that pressure exists in line 88 to move and hold the firing cylinder 74 in its forward sealed position. Since the parts are illustrated in a position just at firing, however, valve 268 has been moved to the firing position wherein power is admitted to line 84 which backs off the firing cylinder and allows the charge of air from the pressure chamber 60 to move into the barrel and propel the baseball outwardly through the barrel. After firing, valves 268 and 274 are reversed wherein firing cylinder 74 is again forced to its forward position and the piston rod 116 is retracted to open the magazine sleeve 108. Valve 266 closes for a fraction just at firing and then opens to cause the chamber 60 to again be pressurized.

Operative control of the air propelling and magazine sleeve is accomplished electrically and in an operation now to be described, reference being had to FIG. 9 which shows the electrical wiring system. Electrical control means may be incorporated in a single box-like housing 278, FIG. 1, supported on the frame. In a preferred operation, circuitry is provided wherein operation of the air cylinders 74 and 110 and the indicator lights 212, 214, and 216 can be accomplished manually, automatically and semi-automatically. In addition, means are provided to start or stop a cycle from a remote point by a radio transmitter.

With particular reference to FIG. 9, the circuitry includes a main switch 282. This switch has three positions, a manual position against a contact 284, an automatic position against a contact 286, and a neutral position isolated from the two contacts. Switch 282 may be key operated to control generally the on/off function of the machine. The system employs feed wires 288 and 290, the line 288 being connected to the system through the switch 282. A wire 292 leads from wire 288 from a point ahead of switch 282 to the other feed wire 290 through a movable contact arm 294 of a relay 296 and also through compressor drive motor 260. Switch 282 also has a contact 298 engageable by the switch arm when the latter is in the manual positon against the contact 284. A wire 300 extends from contact 284 to the other contact 286 and also through the coil of relay 296 and then to the feed line 290. Switch 282 has another contact 302 engageable by the switch arm when the latter is in the automatic position thereof against contact 286, and connected to the contact 302 is a wire 304 which extends through a contact arm 306 of a pulsing relay 308 of a type which

alternates between energized and deenergized conditions as the ratchet therein changes position mechanically. Wire **304** is connected to feed line **290** through contact arm **306** and leads through a cam operating motor **310.** Motor **310** operates a shaft **314,** shown diagrammatically in FIG. **9,** having a plurality of cam operated switches **316, 318, 320, 322** and **324** thereon connected at one side thereof to wire **304.** Leading from switch **316** is a wire **326** connected into feed line **290.** Solenoid operated valve **274** is connected in line **326.** Solenoid operated valve **266** is also connected to line **326** by a branch line **328.** Upon closing of switch **316,** it is apparent that solenoid operated valves **266** and **274** are operated, the arrangment being such that when the solenoid portions of the valves are energized they move them to the position shown in FIG. **10,** namely, a position wherein the pressure chamber **60** is powered and piston rod **116** is moved to the right to close the magazine sleeve **108** of the barrel.

A line **330** extends from switch **318** to feed line **290** and has the signal light **212** incorporated therein. A wire **332** extends from switch **320** to feed line **290** and has the light **214** incorporated therein. A wire **334** extends from switch **322** to the feed line **290** and has the light **216** incorporated therein. It is apparent that upon closing of switches **318, 320** and **322,** the lights **212,** 214 and **216** will be lighted, respectively. A wire **338** extends from switch **324** to feed line **290** and leads through the solenoid of valve **268** whereby upon closing of switch **324** solenoid valve **268** is moved to the positon shown in FIG. **10** which comprises a firing position of the cylinder **74.** An electrically operated counter **339** is in parallel with solenoid valve **268** for counting each cycle.

As stated above relay **308** comprises a pulsing relay for the automatic circuit to be described. This relay will energize and deenergize alternately upon opening and closing of the circuit. Once in operation, it will cause the motor to run continuously in the automatic cycle. It is controlled in its operation, however, by a relay **342,** and as will be apparent hereinafter the latter relay can cause on and off operation of relay **308** in a semi-automatic cycle.

Relay **342** is in a circuit with a normally open push button switch **344.** A wire **346** leads from one side of switch **344** to the wire **304,** and a wire **348** leads from the other side of switch **344** through the relay **342** and is connected to wire **300** which leads to feed line **290.** A wire **350** leads from wire **304** through the contact rm **352** of relay **342** and through the relay **308** to wire **300** whereby upon energization of relay **342** the circuit to the relay **308** is closed and the cycle is placed in operation. The relay **342** is energized by temporarily closing switch **344.**

A radio operated switch mechanism **354** may be incorporated in the control sytem and is connected to wire **346** on the one side thereof by a wire **356** and connected to wire **348** on the other side thereof by a wire **358.** It is apparent that upon closing switch **354** the automatic circuit is placed in operation the same as if push button switch **344** were closed. Switch **354** is a part of a conventional receiver mechanism which may be operated by a remote control transmitter.

Circuits are also provided in combination with the manual side of switch **282** for manually operating solenoid valves **266, 268** and **274** and the lights **212, 214,** and **216.** For the purpose, a wire **362** extends from contact **298** of the switch **282,** and connected to this wire is a lead wire **364** connected to wire **326** and having a switch **366** incorporated therein. A lead wire **368** is connected between wire **362** and wire **330** and has a switch **370** incorporated therein. A lead wire **372** is connected between wire **362** and wire **332** and has a switch **374** incorporated therein. Finally, a normally open, two pole push button switch **378** is incorporated in line **362** and a wire **376** leads from such switch to wire **334.** It is desired that this pushbutton switch operate to pulse the counter **339** so that the manually actuated cycles will also be counted, and for this purpose, switch **378** operates a second switch **377** connected to such counter.

In a preferred arrangement, switches **366, 370** and **374** comprise toggle type on/off switches and switch **378** comprises a spring pressed normally open push button switch. Switches **366, 370, 374** and **378** are thus capable of operating the solenoid operated valves and the indicating lights in a sequence determined by the manual operation thereof.

The semi-automatic operation of the system is controlled in part through the automatic circuitry. It includes an on/off switch **380** in a wire **382** connected between wire **304** and wire **348.** Incorporated in wire **382** is a cam operated switch **384** on shaft **314.**

In the operation of the present baseball propelling machine, such machine is placed in the position desired. Transporting the machine onto the field or wherever desired is readily accomplished by wheeling it on its enlarged wheels to the site. The handle portion of the frame is laid on the ground with the machine aimed in the desired direction. Adjustment of the curve control is accomplished by the selected positioning of the pin **190** in one of the apertures **188** of the curve control mechanism. Suitable adjustment of nut **200** may also be first accomplished. Furthermore, nut **208** is adjusted to adjust the deflecting force of the curve control mechanism against the ball and the type of curve is adjusted by rotation of the barrel to a selected position as held by clamp bolt **166.** The reflex trainer assembly **16** is adjusted for vertical viewing as well as for transverse viewing by clamp bolts **248** and **254.** If desired, the turnbuckle **44** may be disconnected at its upper end from the barrel and the propelling mechanism operated vertically by the operator such as when fielding practice is desired, the operator grasping the handle **54** to manipulate the mechanism. Also if desired, the setscrew **42** may be released to allow free rotation of the upper assembly.

Balls are placed in the magazine, and assuming the magazine sleeve to be retracted, the balls will be stopped by the forward leg of the ball feeder **150.** It is required that the ball feeder be operated pivotally by hand through one of its motions to allow a ball initially to drop into the opening **106** into the barrel.

Assuming that the operator wishes to operate the mechanism by the manual control means, the switch **282** is moved from its neutral position to its manual position in engagement with contacts **284** and **298.** This establishes a circuit in wire **300** and energizes relay **296** which in turn closes the circuit to the compressor motor **260** through the contact arm **294.** In the deenergized conditon of solenoid operated valves **266** and **274,** flow is cut off to the air chamber **60** and to the magazine sleeve operating cylinder **110.** In the deenergized condition of solenoid operated valve **268,** air pres-

sure is directed to the right side of piston head **102** to drive the firing cylinder **74** to the right and seal port **64.** In the manual operation, the operator then closes switch **366** which causes energization of solenoid operated valves **266** and **274** to charge the pressure chamber **60** and to drive the piston rod **116** forwardly and close the magazine sleeve **108.** The operator next closes the switch **370** which turns on the bottom or ready light **212.** Thereupon he closes the switch **374** to turn on the set light **214.** Then he closes switch **378** which turns on the fire light **216** and which energizes solenoid operated valve **268** to allow air pressure into line **84** to retract firing cylinder **74** to cause the charge of air pressure in pressure chamber **60** to propel the ball outwardly through the barrel.

As the operator closes the switches **366, 370** and **374,** it is apparent that the lights will stay on, and before performing the next manual function, such switches have to be opened.

In the automatic operation, switch **282** is operated for engagement of its arm with contacts **286** and **302.** Such movement of the switch applies a circuit through line **304.** Closing the switch to the automatic position establishes a circuit in wire **300** to energize the relay **296,** and such relay in turn closes the circuit to the compressor motor **260** by the circuitry through contact **286,** wire **300** and the contact arm **294** of the relay **296.** The automatic sequence is started either by temporarily closing switch **344** of switch **354.** Upon closing of one of these switches, relay **342** is energized from the circuitry through contact **302,** wires **304, 346, 348** and **300** to feed line **290.** If the switch **354** is utilized, the circuitry is through contact **302,** wires **304, 356, 348** and **300** to feed line **290.** Upon energization of relay **342,** a circuit is established from switch contact **302,** wires **304, 350,** contact arm **352,** and wire **300** to feed line **290.** Such a circuit pulses relay **308** and it will stay closed until pulsed again. Closing of contact arm **306** of relay **308** establishes a circuit through contact **302** and wire **304** to motor **310.** The motor operates the shaft **314** and the cams operate the switches **316, 318,** 320, 322 and **324** in the desired sequence, namely, to operate the solenoid operated valves **266, 274,** lights **212, 214** and **216** and solenoid operated valve **268** in the desired sequence as fixed by the shape of cams **316,** 318, 320, 322 and **324.** The operation of the pressure chamber **60,** the firing cylinder **74** and the magazine sleeve operating cylinder **110** are the same as was described in connection with the manual operation with the exception that motor **310** will continue operating to repeat one cycle after another until such time that the switch **282** is opened, or until switch **380** is closed to run out the last cycle as a semiautomatic cycle. The light sequence preferred as operated by the cams is that they all flash just as the cycle is starting and then when they are turned on, they turn on one at a time from bottom to top through ready, set and fire and stay on until the cycle is over. Such operation of the lights, or any other variation thereof, is determined by the shape of the cams on the shaft **314.**

In the semi-automatic operation, the operating steps are the same as in the automatic operation with the exception that the operator also closes the switch **380** when he wants to complete one cycle or to pitch one ball. Thereupon, to start a cycle, he actuates either the switch **344** or **354.** When one of these switches is closed, relay **342** will be energized to pulse relay **308.** This will start the automatic operation. Cam operated switch **384,** however, being in the circuit to relay **342,** is arranged to pulse such relay upon the completion of one cycle and cause relay **308** to pulse to its open contact condition. Each cycle thus has to be started by a temporary closing of either switch **344** or **354.**

In accordance with the present invention, a baseball propelling machine is provided which overcomes the disadvantages of prior machines and at the same time is as simplified and economical to manufacture.

The operation of the lights in their sequence provides a novel reflex trainer for batters and is intended to train individuals in batting approximately the same as if they were being pitched to by a human pitcher. That is, by the use of three lights disposed one above the other and by sequential operation from bottom to top, the batter can determine at all times the progress of the pitching step and in fact the precise phase at which it is in. No anticipation is necessary. The line of sight is from a lower level and then proceeds up until it finally is toward the end of the barrel. Such has been found to operate with great success in training batters.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described by invention, I claim:

1. A ball propelling machine comprising a support, a barrel on said support for receiving a ball to be propelled therefrom, propelling means associated with said barrel for propelling a ball from the latter, light means on said support providing a reflex trainer for a person using the machine, power means for said light means, said light means including at least three individual adjacent lamps located in an upright arrangement under said barrel, and control means between said power means and said three lamps briefly flashing all of said lamps on and off simultaneously in an initial operation and then lighting them individually to indicate respectively a ready condition, a set conditon just prior to firing of the ball, and a firing condition at the time of firing the ball, said lamps being disposed in their upright arrangement with the ready condition lamp lowermost, the set condition lamp immediately thereabove, and the firing condition lamp immediately above said set condition lamp.

2. The baseball propelling machine of claim **1** wherein said control means is arranged such that as said lamps are lit individually, each of said three lamps remains lighted until the sequence is completed.

3. A ball propelling machine comprising a support, a barrel on said support for receiving a ball to be propelled therefrom, propelling means associated with said barrel for propelling a ball from the latter, light means on said support providing a reflex trainer for a person using the machine, said light means including at least three individual adjacent lamps, manual and automatic means for operating said lamps in timed sequence to indicate respectively a ready condition, a set condition just prior to firing of the ball, and a firing condition at the time of firing the ball, and selector means for selecting the use of one of said manual and automatic control means, said manual control means including manually operable switches for controlling operation of the propelling means and the lamps and said automatic control

means including a cam shaft and operating switches for controlling operation of the propelling means and the lamps in sequence.

4. The ball propelling machine of claim **3** wherein said automatic control means includes means for operating the machine through one sequence and then stopping it.

5. A ball propelling machine comprising a support, a barrel on said support for receiving a ball to be propelled therefrom, propelling means associated with said barrel for propelling a ball from the latter, a housing mounted on said support having an open front, light means in said housing visible through said open front providing a reflex trainer for a person using the machine, said light means including at least three individual adjacent lamps, and control means lighting said lamps in timed sequence to indicate respectively a ready condition, a set condition just prior to firing of the ball, and a firing condition at the time of firing the ball.

6. The ball propelling machine of claim **5** including means pivotally supporting said housing on a horizontal axis allowing the housing to rotate rearwardly if struck by a baseball to cushion the blow to the housing.

7. The ball propelling machine of claim **6** including means adjusting the housing at different vertically angled positions as well as laterally angled positions for best viewing to a person using the machine.

8. A ball propelling machine comprising a support, a barrel on said support for receiving a ball to be propelled therefrom, propelling means associated with said barrel for propelling a ball from the latter, spin control mechanism on said barrel, means mounting said spin control mechanism on said barrel in the path of balls to be propelled from the barrel, said spin control mechanism comprising flexible finger means having an end portion which is in the path of and engageable by the balls, said finger means being mounted on a rotatable hub on the barrel, and an abutment pin on said mounting means engageable by said finger means and arranged to resist rotation of said finger means when engaged by the balls to apply spin to the balls, light means on said support providing a reflex trainer for a person using the machine, said light means including at least three individual adjacent lamps, and control means lighting said lamps in timed sequence to indicate respectively a ready condition, a set condition just prior to firing of the ball, and a firing condition at the time of firing the ball.

9. The ball propelling machine of claim **8** including adjustment means on said spin control mechanism to vary the amount of projection of said finger means into the path of the balls to vary the rate of spin applied to the balls.

10. The ball propelling machine of claim **8** including adjustment means for said abutment pin to vary the resistance of rotation applied thereby to said finger means and thus vary the spin applied to the balls.

11. The ball propelling machine of claim **8** including a front extension on said barrel arranged to be rotated to different adjusted positions relative to said barrel, said spin control mechanism being mounted on said extension whereby upon rotative adjustment of said extension different curved directions can be applied to the balls.

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