

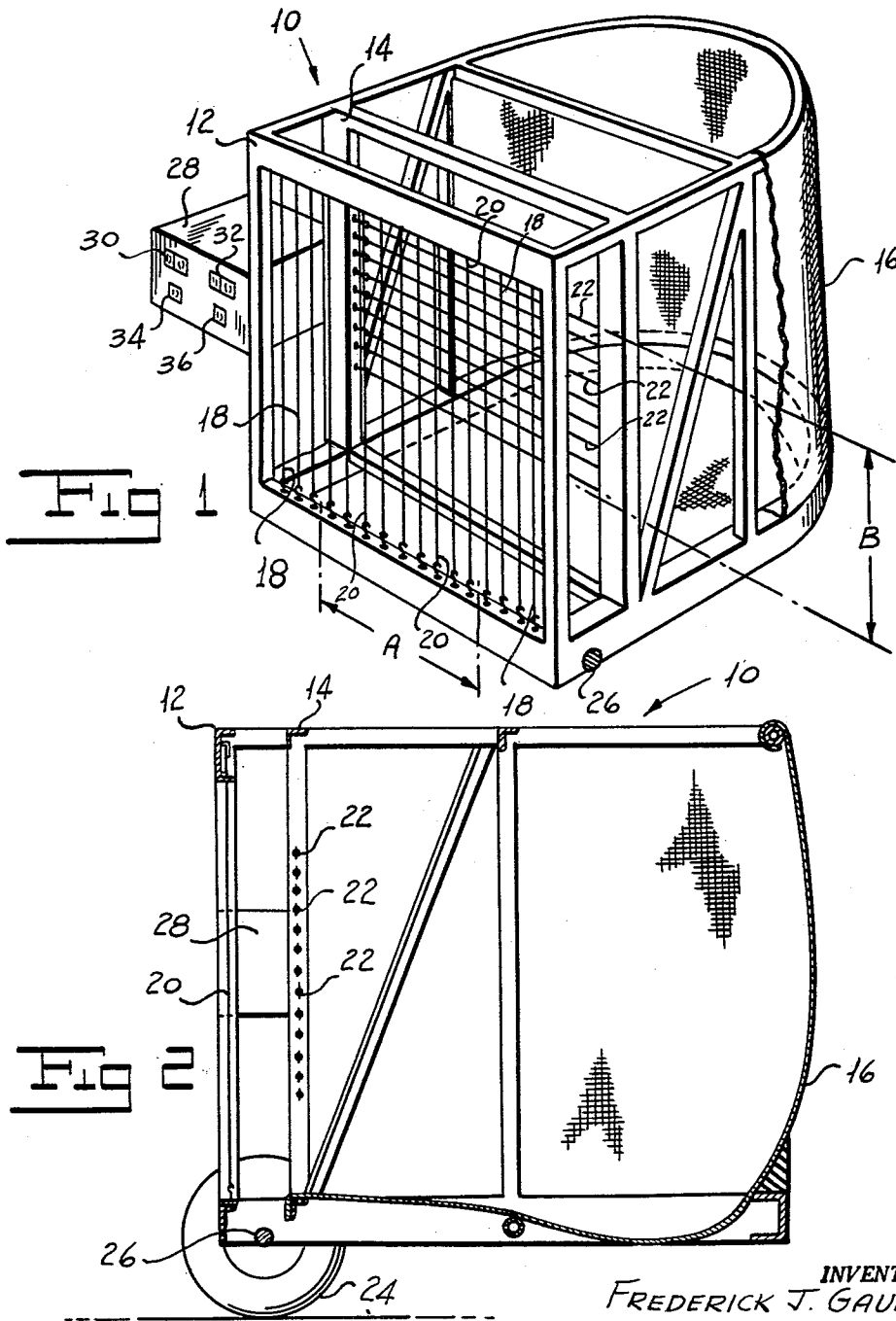
Nov. 17, 1964

F. J. GAUDET
BASEBALL PITCHING PRACTICE TARGET WITH
BALL AND STRIKE INDICATORS

3,157,399

Filed May 4, 1960

5 Sheets-Sheet 1



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Filed May 4, 1960

BASEBALL PITCHING PRACTICE TARGET WITH
BALL AND STRIKE INDICATORS

5 Sheets-Sheet 2



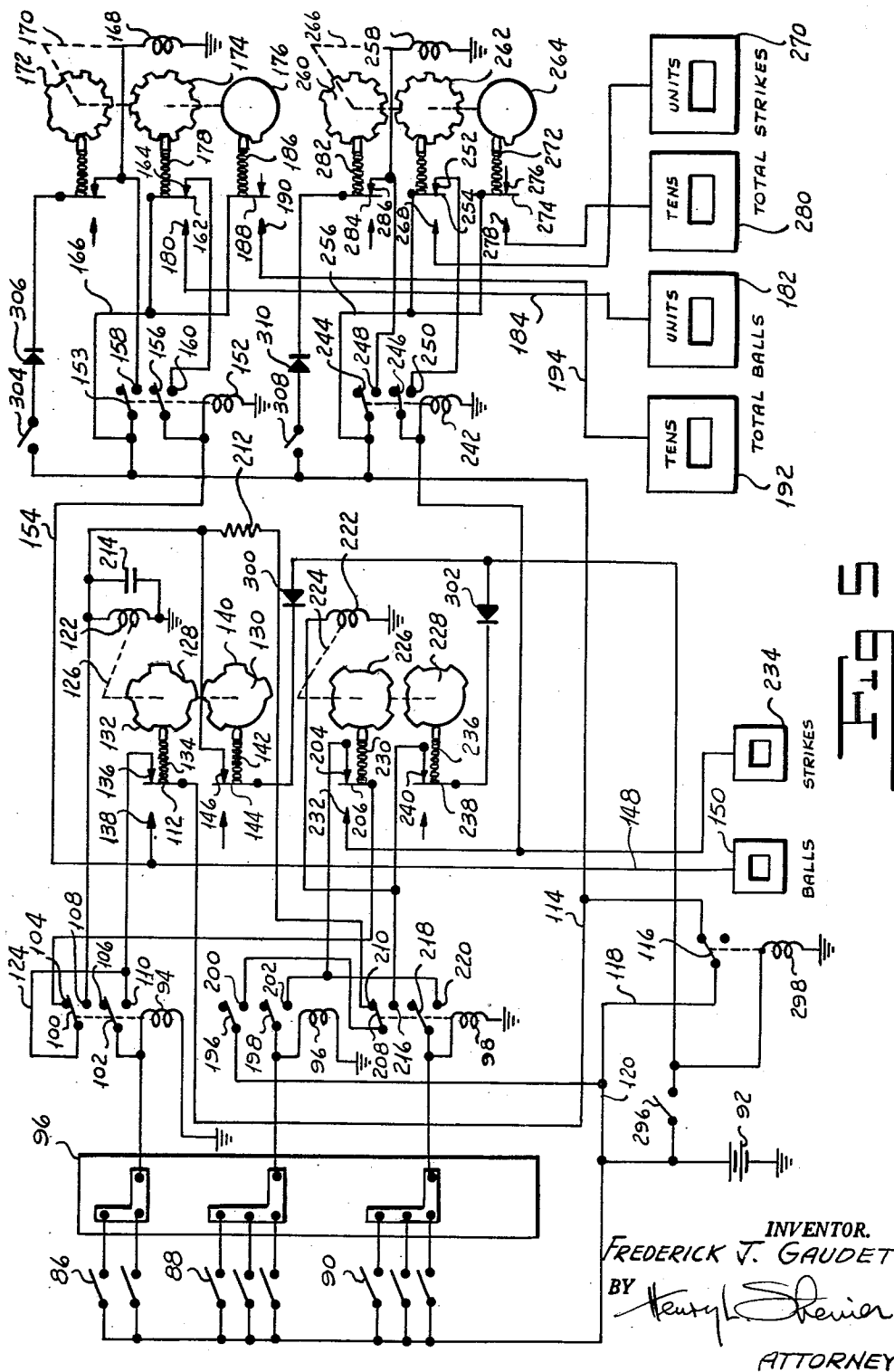
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BASEBALL PITCHING PRACTICE TARGET WITH
BALL AND STRIKE INDICATORS

5 Sheets-Sheet 3

Filed May 4, 1960



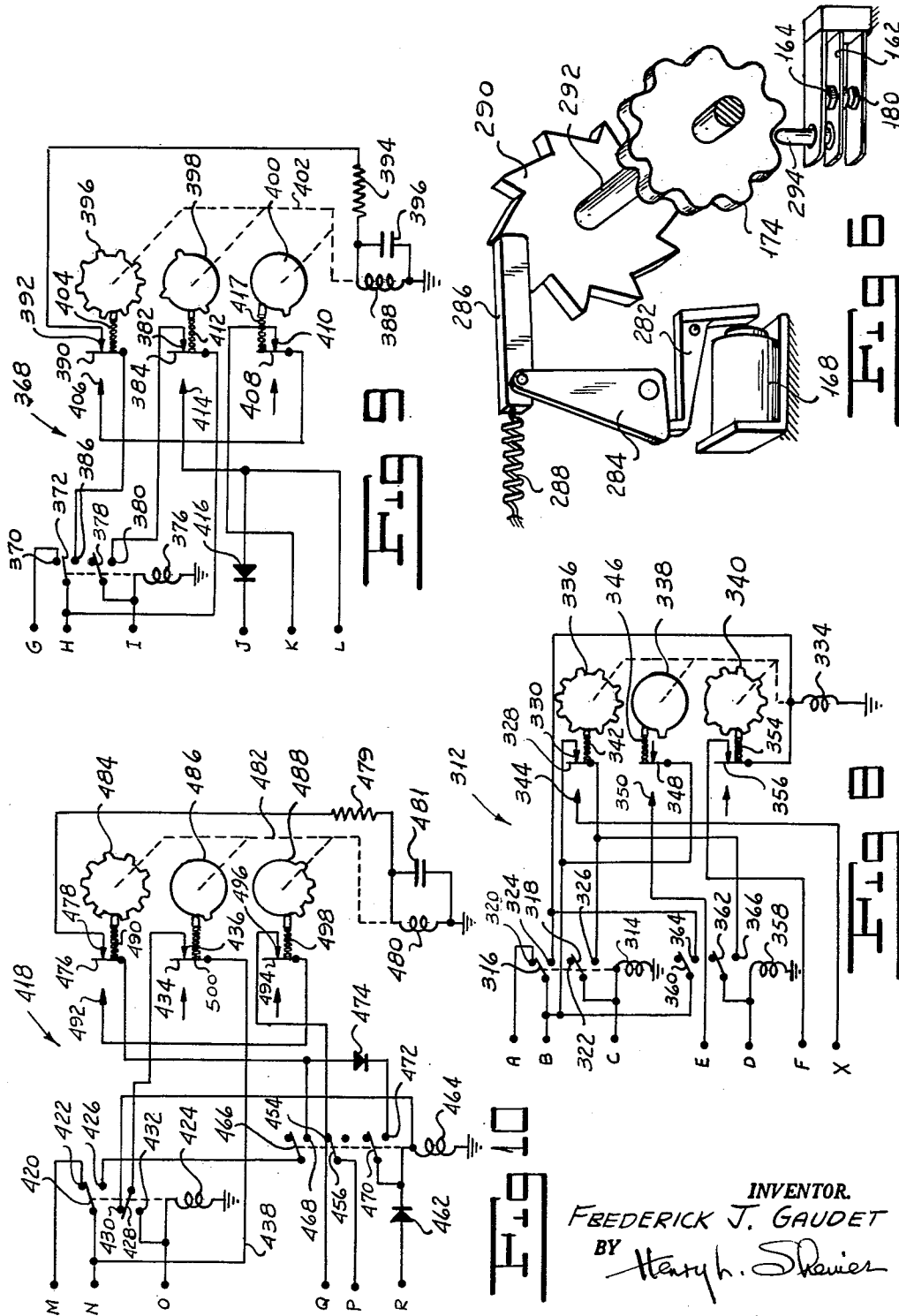
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3,157,399

Filed May 4, 1960

5 Sheets-Sheet 4



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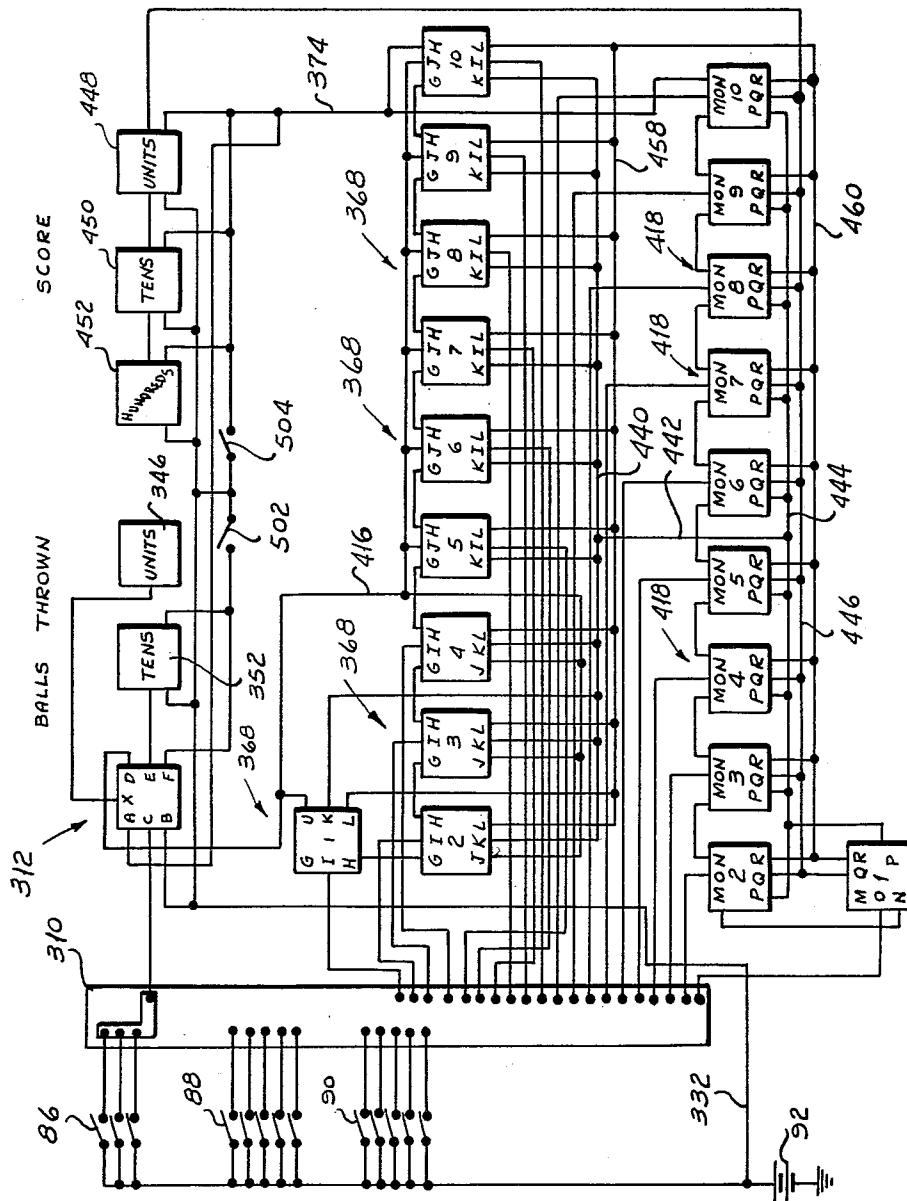
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3,157,399

Filed May 4, 1960

5 Sheets-Sheet 5



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1

3,157,399

BASEBALL PITCHING PRACTICE TARGET WITH BALL AND STRIKE INDICATORS

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Filed May 4, 1960, Ser. No. 26,786
6 Claims. (Cl. 273-26)

My invention relates to a baseball pitching practice device and more particularly to a device for indicating the accuracy with which a pitcher throws pitches toward a strike zone.

There are known in the prior art various devices which may be used for a pitcher in practicing to improve his skill. In general these devices do not define the strike zone with a sufficient degree of accuracy. Many of these devices of the prior art require that a pitch thrown at the device be arrested in order to actuate the indicating means of the device. As a result of the shocks they must absorb these units have a relatively short life. The devices of the prior art employed for this purpose indicate whether or not a pitch thrown toward the device will pass through the strike zone. In general they make no provision for indicating the precise location within the strike zone through which the pitch will pass. Thus, they do not afford a practicing pitcher having a reasonable degree of skill with an indication which is sufficiently accurate to permit him to improve his skill in throwing a pitch toward particular areas within the strike zone.

I have invented a baseball pitching practice device which overcomes the disadvantages of devices of the prior art pointed out hereinabove. My device defines both the lateral and the vertical extent of the strike zone with a high degree of accuracy. My device has a relatively long life as compared with devices of the prior art in that it does not require a pitch thrown toward the device to be stopped in order that the indicator of the device be actuated. My baseball pitching practice device is highly flexible in that it may readily be set up either to register just strikes and balls or to register various scores for different areas within the strike zone. My device is relatively simple in construction for the result achieved.

One object of my invention is to provide a baseball pitching practice device which registers balls or strikes thrown toward the device with a high degree of accuracy.

Another object of my invention is to provide a baseball pitching practice device which is rugged and which has a long life in that it does not require a pitch thrown toward the device to be stopped in order to actuate its indicator.

A further object of my invention is to provide a highly flexible baseball pitching practice device which may be set up either to register merely balls and strikes in the case of a relatively inexperienced pitcher or which may be set up to give various scores for different areas within the strike zone in the case of the more experienced and more skillful pitcher.

Still another object of my invention is to provide a baseball pitching practice device which is relatively simple in construction for the result achieved by the device.

Other and further objects of my invention will appear from the following description.

In general my invention contemplates the provision of

2

a baseball pitching practice device having a pair of spaced frames one of which carries actuable means defining the lateral extent of the strike zone and the other one of which carries actuable means defining the vertical extent of the strike zone. In response to the actuation by a pitch passing through the frames of both the actuable means carried by the respective frames the device registers a strike. In response to the actuation by a pitch passing through the frames of only one of the actuable means carried by the respective frames the device registers a ball. Means may be provided for indicating that a pitch passing through the frames entirely without the strike zone is a ball. The device may be set up either to register only balls and strikes or it may be set up to give scores which depend upon that area of the strike zone through which is a pitch passes.

In the accompanying drawings which form part of the instant specification and which are to be read in conjunction therewith and in which like reference numerals are used to indicate like parts in the various views.

FIGURE 1 is a perspective view of one form of my baseball pitching practice device;

FIGURE 2 is a sectional view of the form of my baseball pitching practice device shown in FIGURE 1;

FIGURE 3 is a fragmentary sectional view of the form of my baseball pitching practice device shown in FIGURE 1 with parts broken away and illustrating the details of a mechanical form of actuable means which may be employed.

FIGURE 4 is a schematic view indicating the details of a photoelectric type of actuable means which may be used on my baseball pitching practice device;

FIGURE 5 is a schematic view of a form of electrical circuit which may be used with my baseball pitching practice device to indicate balls and strikes;

FIGURE 6 is a fragmentary perspective view of my baseball pitching practice device indicating one form of counter actuating means which may be used;

FIGURE 7 is a schematic view of an alternate form of electrical circuit which may be used with our device to give various scores for different areas of the strike zone;

FIGURE 8 is a schematic view illustrating the details of the balls-thrown counter actuating unit of the form of my invention shown in FIGURE 7;

FIGURE 9 is a schematic view showing the details of the ball-or-strike counter actuator unit of the form of my invention shown in FIGURE 7;

FIGURE 10 is a schematic view of a strike counter actuator unit of the form of my invention shown in FIGURE 7.

Referring to FIGURES 1 to 4 of the drawings, one form of my baseball pitching practice device includes a framework, indicated generally by the reference character 10, includes spaced front and rear frames 12 and 14 through which a pitch passes to a catcher made up of a fabric 16 or the like supported on the framework 10. The frame 12 carries a plurality of cords 18 which extend vertically between the top and the bottom of the frame 12. The cords 18 carried by the frame 12 define an area extending to the left and to the right of the strike zone, which area may be termed a "ball" area since any pitch passing through this area is outside the left and right extent of the strike zone indicated by the distance A in FIGURE 1. Since a pitch striking one of

the cords 18 in the course of its passage through the frame 12 definitely is outside the strike zone, the cords 18 are termed "ball" cords. The frame 12 carries a number of vertically extending cords 20 disposed within the left-to-right extent A of the strike zone.

A pitch striking one of the cords 20 in the course of its passage through the frame 12 may be a "ball" if it is outside the vertical extent of the strike zone indicated by the distance B in FIGURE 1 or it may be a strike if it is within the vertical extent of the strike zone. Thus the cords 20 are termed "ball-or-strike" cords.

From the structure just described it will be seen that a pitch passing through the frame 12 to the left or to the right of the central "ball-or-strike" cords 20 definitely is a ball while a pitch striking one of the cords 20 may be a ball or it may be a strike. The frame 14 disposed behind the frame 12 carries a plurality of horizontally extending cords 22 all of which are disposed within the vertical extent B of the strike zone. A pitch which strikes a cord 20 in the course of its passage through frame 12 but which is outside the vertical extent B of the strike zone misses all the cords 22 with the result that it is known to be a ball. A pitch striking one of the cords 20 which pitch is within the vertical extent B of the strike zone will in the course of its passage in the frame 14 strike a cord 22 definitely to indicate that this pitch is a "strike."

If desired, I may support the framework 10 on wheels 24 carried by an axle 26. The framework 10 supports a counter indicator 28, which in one form of my device has a window 30 indicating the total number of balls, a window 32 indicating the total number of strikes, a window 34 indicating the number of balls for a hypothetical "batter," and a window 36 showing the number of strikes on the "batter." I arrange each one of the cords 18, 20, and 22 to actuate a suitable switch. Since all the cords and switches are substantially similar, I will describe only the switching arrangement associated with the cords 20 in detail.

Referring now to FIGURE 3 I secure the lower end of each cord 20, which may be formed of any suitable material such, for example, as nylon, to an eye 40 by means of a fitting 38. Each eye 40 engages a hook 42 adjustably mounted in the base 44 of the frame 12 by means of nuts 46 and 48. The upper end of each cord 20 passes through a grommet 50 in the lower flange 52 of the top 54 of frame 12. A fitting 56 secured to the upper end of the cord 20 by any suitable means such as by a set screw 58 fastens the cord to a linkage 60 pivotally connected to a pin 62 carried by a switch actuating arm 64 rotatably carried by a pin or screw 66 on the top 54. I mount a microswitch 68 on the top 54 in a position adjacent each arm 64 to be actuated by the arm when it moves in a clockwise direction as viewed in FIGURE 3. A spring 70 carried by a bracket 72 on the top 54 normally biases the arm 64 to a position at which it is out of engagement with its associated switch.

From the structure just described it will be seen that when any one of the cords 18, 20, or 22 is struck by a pitch, the cord moves its associated arm 64 to operate the corresponding switch 68.

It is to be understood that while I have shown cords 18, 20, and 22 for mechanically actuating switches 68, I could as well employ other arrangements. For example, I could replace each one of the cords 18, 20, and 22 with a photoelectric system for operating a switch. Referring now to FIGURE 4, in such an arrangement each of the cords 20 would be replaced by a source of illumination such, for example, as a lamp 72 adapted to direct illuminating radiation onto the sensitive element of a photoelectric cell 74. In this arrangement one of lamps 72 and photocell 74 would be carried by the bottom 44 of frame 12 while the other one of the lamps and photocell would be carried by the top 54. Alternatively the provision of a plurality of lamps 72, a single source of illumination disposed behind a mask having a number of

apertures corresponding to the number of cords 18 and 20 could be used. In the arrangement shown in FIGURE 4 I connect the photocell 74 in series with a resistor 76 between the terminal 78 of a suitable source of potential and ground. I connect a relay winding 80, adapted when energized to close a normally open switch 82 through a linkage 84, in parallel with the photocell 74. With light from the lamp 72 impinging on the sensitive element of the photocell 74 insufficient current flows through the winding 80 to permit it to close the switch 82. When, however, a pitch interrupts the beam of light to de-energize the photocell 74, then relay winding 80 energizes to close switch 82 in an analogous manner to that in which a cord 20 mechanically closes switch 68.

Referring now to FIGURE 5, I have shown the electrical circuit of a form of my baseball pitching and practice device adapted to register and to indicate the total number of balls, the total number of strikes, and the number of balls and strikes for each hypothetical batter. This form of my device includes a number of normally open ball switches 86 adapted to be actuated by cords 18 or by a photoelectric arrangement of the type shown in FIGURE 4, a number of normally open ball-or-strike switches 88 adapted to be operated by cords 20 or by photoelectric relays and a number of normally open strike switches 90 adapted to be actuated by cords 22 or by photoelectric relays. I connect the switches 86 between the positive terminal of a suitable source of potential such as a battery 92 and a ball relay winding 94 through the medium of a terminal board 96. In a similar manner I connect the switches 88 in parallel between the battery 92 and a ball-or-strike relay winding 96. I connect the switches 90 in parallel between the battery 92 and a strike relay winding 98.

Let us assume by way of example that a pitch passing through the frame 12 strikes a ball cord 18 momentarily to close a normally open switch 86. When the switch closes, the circuit of relay winding 94 is complete to energize the winding to cause the winding to draw a pair of contact arms 100 and 102 out of engagement with their associated upper contacts 104 and 106 and into engagement with their respective lower contacts 108 and 110. This operation completes a holding circuit for the winding 94 through the switch arm 102, through a cam operated counter switch arm 112 normally in engagement with a contact 136 connected to contact 110, through a conductor 114, through a reset switch arm 116, and through conductors 118 and 120 to the battery 92. At the same time the engagement of arm 100 with contact 108 completes the circuit of a ball counter solenoid winding 122 from the winding through contact 108 and arm 100; through a conductor 124 connected to contact 136 and through the portion of the holding circuit just described from arm 112 to the battery 92. Energization of the solenoid winding 122 operates a ratchet and pawl mechanism to be described in detail hereinafter and indicated schematically by the broken line 126 in FIGURE 5 to step a ball counter cam 128 and a ball reset cam 130 through one step of rotation. When the cam 128 steps, one of its projections 132 acts through a spring 134 to move arm 112 out of engagement with contact 136 and into engagement with a contact 138. At the same time a projection 140 on cam 130 acts through a spring 142 to move a switch arm 144 out of engagement with the contact 146. I connect the contact 138 to a counter 150 by means of a conductor 148 to indicate the number of balls pitched to an individual hypothetical batter.

When the arm 112 moves out of engagement with the contact 136, it interrupts the holding circuit for winding 94 and also interrupts the circuit of the ball counter winding 122. When the arm 112 engages contact 138, it completes the circuit of a total balls relay winding 152 from the winding 152 through a conductor 154 to contact 138 and arm 112 to conductor 114 through switch arm

5

116 and conductors 118 and 120 to battery 92. Upon its energization the relay winding 152 moves its contact arms 153 and 156 into engagement with lower switch contacts 158 and 160. The engagement of contact arm 156 with contact 160 completes a holding circuit for winding 152 through a units total balls counter switch arm 162 normally in engagement with a contact 164 connected to a contact 160. This holding circuit is complete through arms 156 and 162 in engagement with contacts 160 and 164 to a conductor 166 connected to conductor 114. The engagement of switch arm 153 with contact 158 completes the circuit of the total balls counter solenoid winding 168 from conductor 120 connected to battery 92, through conductor 114, through arm 153 and contact 158 to the winding 168. Upon its energization winding 168 acts through a ratchet and pawl indicated schematically at 170 in FIGURE 5 to step a reset cam 172, a units ball-counter cam 174 and a tens ball-counter cam 176. As the cam 174 steps through a tenth of a revolution in response to the energization of winding 168, it acts against a spring 178 to move contact arm 162 out of engagement with contact 164 and into engagement with a contact 180 to apply a pulse to the units balls indicator 182 through a channel 184. It will be appreciated that, if desired, a drum carrying ten numerals could be mounted directly on the shaft carrying the cams 172, 174, and 176 to indicate the units digit in the total number of balls. Each time the shaft carrying the cams 172, 174, and 176 goes through a single revolution cam 176 acts against a spring 186 to move a switch arm 188 into engagement with a contact 190 to apply a pulse to the total-balls, tens-digit indicator 192 through a channel 194.

From the structure just described it will be seen that when pitches strike any of the balls cords 18, the number of balls for an individual theoretical batter is indicated on the counter or indicator 150 while the total number of balls for any practice session is indicated on the counters 192 and 182. Let us now assume that a pitch passing through the frame 12 strikes a cord 20 which is within the left and right extent A of the strike zone. When this occurs, a switch 88 closes to complete the circuit from battery 92 to winding 96 to energize the winding and thus to move respective switch arms 196 and 198 into engagement with contacts 200 and 202. When the arm 198 engages the contact 202, it completes a holding circuit for the winding 96 through the switch arm 198, through a contact 204 engaged by a cam operated switch arm 206, through the contact 104 and switch arm 100 to conductor 124, and through the contact 136 and switch arm 112 to the conductor 114 which is connected to conductor 120 by switch arm 116 and conductor 118. At the same time as arm 198 engages contact 202, contact arm 196 engages contact 200 to complete a circuit from the battery conductor 120 through arm 196 and contact 200 through a switch arm 208 in engagement with a contact 210 and through a resistor 212 to winding 122. I connect a capacitor 214 in parallel with winding 122. Owing to the resistance of resistor 212 and the capacitance of capacitor 214 in this circuit winding 122 is not immediately energized upon the engagement of arm 196 with contact 200.

Let us assume that the pitch which has actuated a ball or strike cord 20 in the frame 12 now passes through the frame 14 without actuating any of the cords 22 defining the vertical extent B of the strike zone. Under these conditions after a short delay solenoid winding 122 is energized and a ball is registered on the counter 150, which indicates the number of balls pitched to an individual hypothetical batter. A ball also is registered on the counters 192 and 182, which register the total number of balls thrown in a particular practice session in the manner described hereinabove.

If a pitch which has actuated a ball or strike cord 20 in the course of its passage through frame 12 now strikes

6

a cord 22 in the course of its passage through frame 14 and before sufficient time has elapsed for winding 122 to be energized, a switch 90 closes to complete the circuit from battery 92 to winding 98 to draw arm 208 out of engagement with the contact 210 and into engagement with the contact 216 and to move a contact arm 218 into engagement with a contact 220. It will be seen that the movement of arm 208 out of engagement with contact 210 interrupts the circuit of winding 122 to prevent this winding from registering a ball. Movement of arm 218 into engagement with contact 220 completes a holding circuit for winding 98 through contact 204 and arm 206, through contact 104 and arm 100 to conductor 124 and through contact 136 and arm 112 to conductor 114 which is connected to battery 92 by conductor 120, the switch 116, and conductor 118. At the same time the engagement of arm 208 with contact 216 completes the circuit of the individual hypothetical batter strike counter actuating solenoid winding 222 from the winding through contact 216 and arm 208 and through contact 200, which it will be remembered is engaged by the arm 196 connected to conductor 120. Upon its energization winding 222 operates a ratchet and pawl mechanism indicated by the reference character 224 to step a strike counter actuating cam 226 and a reset cam 228. When in response to the energization of winding 222 the shaft carrying cams 226 and 228 steps through a quarter of a revolution, cam 226 acts against a spring 230 to move arm 206 out of engagement with contact 204 to interrupt the holding circuits of windings 96 and 98 and into engagement with a contact 232 to supply a pulse to a strike counter 234 which registers the number of strikes thrown to an individual batter. This circuit is complete from arm 206 through contact 104 and arm 100 to conductor 124 and through contact 136 and arm 112 to conductor 114 which is connected to battery conductor 120 through arm 116 and conductor 118. At the same time cam 228 acts against a spring 236 to move a contact arm 238 out of engagement with the contact 240.

When arm 206 engages contact 232, it completes the circuit of a total strikes relay winding 242 through the circuit outlined above. When energized, winding 242 moves respective switch arms 244 and 246 into engagement with contacts 248 and 250. The engagement of arm 246 with contact 250 completes a holding circuit for winding 242 from the winding through arm 246 and contact 250 through a switch contact 252 and arm 254 and through a conductor 256 to the battery conductor 120. At the same time the engagement of switch arm 244 with a contact 248 completes a circuit from conductor 120 to a winding 258 adapted to step a reset cam 260, a units strike counter cam 262 and a tens strike counter cam 264 through a ratchet and pawl mechanism 266. When in response to the energization of winding 258, cam 262 steps through a tenth of a revolution it moves arm 254 out of engagement with contact 252 and into engagement with a contact 268 to send a pulse to the units counter 270 of the total strikes indicator. It will be appreciated that, if desired, the units counter 270 could be in the form of a dial carried directly by the shaft which supports the cams 260, 262, and 264. Each time the shaft carrying the cams goes through a single revolution cam 264 acts against a spring 272 to move an arm 274 out of engagement with a contact 276 and into engagement with a contact 278 to apply a pulse to the tens digit counter 280 of the total balls indicator. It will be noted that when arm 254 moves out of engagement with contact 252, the holding circuit of winding 242 is interrupted. In the normal course of operation of the device, each time winding 258 is energized cam 260 acts against a spring 282 to move an arm 284 out of engagement with a contact 286.

From the structure thus far described it will be seen that each time a pitch passing through the frame 12

strikes a cord 18 it causes a ball to be registered on the counter 150 which shows the number of balls pitched to an individual hypothetical batter. At the same time a ball is registered on the counters 192 and 182 showing the total number of balls for a particular practice session. If a pitch strikes a cord 20 in passing through the frame 12 but fails to strike a cord 22 in passing through frame 14, a ball is registered in the same manner as that described. If a pitch passing through frames 12 and 14 strikes both a cord 20 and a cord 22, then the counter 234 registers a strike for the individual hypothetical batter and the counters 280 and 270 register this strike from the particular practice session.

Referring now to FIGURE 6, I have illustrated the details of one of the counter cams. By way of example I have shown the cam 174 associated with the switch comprising a resilient arm 162 normally in engagement with the contact 164 and adapted to be moved into engagement with a contact 180 when the shaft steps. As has been explained hereinabove, when winding 168 is energized, it acts through a mechanism indicated schematically in FIGURE 5 at 170 to step the shaft. One form of this mechanism as shown in FIGURE 6 may include an armature 282 which pivots in response to the energization of winding 168 to drive a bell crank 284 in a clockwise direction as viewed in FIGURE 6 to move a pawl 286 to the right against the action of a spring 288. When the pawl moves, it engages a ratchet wheel 290 to move the shaft 292 carrying cam 174 through an angle corresponding to the distance from the base of one of the cam detents to a position at the beginning of the next detent. In this position of the parts, switch arm 162 is in engagement with contact 180. When the winding 168 is de-energized, spring 288 returns the pawl and the leaf spring arm 162 acting through a follower 294 in engagement with the cam, causes the follower to ride into the base of the next detent and arm 162 again engages contact 164. The arrangement is such that as long as the winding 168 remains energized, shaft 292 cannot rotate to a position at which the follower 294 is in the base of the next recess.

Referring again to FIGURE 5, I connect a reset switch 296 for the individual hypothetical batter counters 150 and 234 between the battery 92 and one terminal of a winding 298, the other terminal of which is connected to ground. When counter 150 indicates four balls or when counter 234 indicates three strikes to show either that a "walk" has been issued or that the batter has struck out, the practicing pitcher closes switch 296 to energize winding 298, thus to open switch 116 to disable the holding circuits for windings 94, 96, 98, 152 and 242. At the same time potential is applied to winding 122 through a diode 300 and through arm 144 and contact 146. Similarly, potential is applied to the winding 222 through a diode 302 and through arm 238 and contact 240. In response to this potential cams 128 and 130 step, causing the arm 144 to leave the contact 146 to interrupt the energizing circuit each time a projection 140 acts against spring 142. It will be seen that in the location around the periphery the reset cam 130 corresponding to the zero position of cam 128 a projection 140 is missing. Thus, when the cam 130 steps into this position, the reset energizing circuit through switch arm 144 is not interrupted and the pawl in the actuating mechanism of this system will not be withdrawn to permit cam 128 to arrive at the zero position until the reset switch 296 is opened to interrupt the circuit of winding 122. Cams 226 and 228 operate in a similar manner so that, with switch 296 closed, both the ball counter actuating cam 128 and the strike counter actuating cam 226 step around to just before their zero positions. When the switch 296 is opened, both cams 128 and 226 go into their zero positions. I provide a reset switch 304 for applying a reset potential to winding 168 from conductor 114 through a diode 306. A switch 308 connected in series with a diode 310 between conductor

114 and switch arm 284 provides a means for applying a reset potential to winding 258. The resetting of the total balls and total strikes counters is accomplished in a manner similar to that outlined above in connection with the ball and strike counters for the individual hypothetical batter counters 150 and 234.

Referring now to FIGURE 7, I have shown an alternate form of my baseball pitching practice device in which areas of the strike zone are weighted to give a score depending upon that area of the strike zone through which a pitch passes. This form of my invention, like the form of the invention shown in FIGURE 5, includes a plurality of ball switches 86, a plurality of ball-or-strike switches 88, and a plurality of strike switches 90, all of which are connected in parallel between the source of potential such as a battery 92 and a terminal board 310. The form of my invention shown in FIGURE 7 includes a balls-thrown counter actuator unit, indicated generally by the reference character 312 in FIGURE 7 and shown in detail in FIGURE 8. All the ball switches 86 are connected in parallel between the source of potential 92 and a terminal C of the unit 312 through the terminal board 310. Whenever a pitch passing through frame 12 strikes a cord 18, potential is applied to a relay winding 314 to move respective contact arms 316 and 318 out of engagement with contacts 320 and 322 and into engagement with contacts 324 and 326. The engagement of the arm 318 with contact 326 completes a holding circuit for winding 314 from the winding, through arm 318 and contact 326, and through a switch arm 328 normally in engagement with a contact 330 connected to the terminal B of the unit 312 which is connected to the battery 92 by a conductor 332. Engagement of the arm 316 with contact 324 completes the circuit from the battery through conductor 332 and terminal B to a winding 334 adapted when energized to step a units balls counter actuator cam 336, a tens balls counter actuating cam 338, and a balls-thrown counter reset cam 340 through one step of revolution. As it passes through a step of revolution, cam 336 acts against a spring 342 to move contact arm 328 out of engagement with contact 330 and into engagement with a contact 344 connected to a terminal X leading to the balls-thrown units indicator 346. Upon the occurrence of the tenth step of the cams, cam 338 acts against a spring 346 to move a contact arm 348 into engagement with a contact 350 to apply potential to the terminal E which is connected to the balls-thrown tens indicator 352. When a reset potential is applied to the terminal F which is connected to a contact 354 normally engaged by an arm 356 actuated by reset cam 340, this unit functions to reset the balls-thrown counter mechanism to zero in a manner analogous to that described hereinabove in connection with the form of the invention shown in FIGURE 5.

It will be appreciated that the structure thus far described is very similar to that of the balls counter mechanism in the form of my invention shown in FIGURE 5. The unit 312 includes a relay winding 358 connected between a terminal D to which potential is applied in a manner to be described hereinafter and ground. When energized, winding 358 moves respective contact arms 360 and 362 into engagement with contacts 364 and 366 connected respectively to contacts 324 and 326. When winding 358 is energized, the balls-thrown counters are actuated in the same manner as that described hereinabove when the winding 314 is energized.

I provide the form of my invention shown in FIGURE 7 with a plurality of ball counters, each of which is indicated generally by the reference character 368 in FIGURE 7 and one of which is shown in detail in FIGURE 9. Each of the units 368 comprises a terminal G connected to a contact 370 normally engaged by an arm 372 connected to terminal H. I so arranged the units 368 that they give various counts or weights in the scoring. By way of example, I have shown ten units 368

adapted to score from one to ten points. I have indicated the number of points scored by each of the units within the block representing the unit in FIGURE 7. In order to energize these units I connect the terminal A of the unit 312 which is normally connected to the terminal B of the unit through contact 320 and switch 316 to the terminal H of the highest count unit 368 by a conductor 374. A circuit is normally complete between the terminals G and H of each unit 368 by the engagement of contact arm 372 with contact 370. I connect the terminal G of a higher count device to the terminal H of the next lower count device. In this manner all of the units 368 normally are conditioned to permit their operation. However, when the arm 372 of any unit moves out of engagement with the contact 370 of that unit, then all lower count units are disabled. I connect the respective terminals I of the units 368 to terminals carried by the board 310. I connect the switches 88 to various ones of the terminals to which units 368 are connected to give whatever weight is desired to areas of the left-and-right extent of the strike zone. When a pitch passing through the frame 12 strikes a cord 20 to close a switch 88 associated with a particular unit 368, the circuit of a relay winding 376 of that unit is complete to move arm 372 out of engagement with contact 370 to disable all lower count units. At the same time the winding 376 moves an arm 378 into engagement with a contact 380 to complete a holding circuit for the winding through a contact 382 and an arm 384 connected to the terminal H of the unit. When arm 372 moves out of engagement with contact 370 it strikes a contact 386 to complete the circuit of a stepping winding 388 through a contact arm 390 normally engaging a contact 392. A delay network including a resistor 394 and a capacitor 396 delays the action of winding 388 until the pitch has had time to pass through frame 14. When winding 388 is energized, it steps a ball-counter actuator cam 396, a circuit interrupting cam 398, and a cam 400 through a mechanism 402. Each time cam 396 steps, it acts against a spring 404 to move arm 390 out of engagement with the contact 392 and into engagement with a contact 406 normally to apply an output pulse to the terminal K of the unit through a switch arm 408 normally in engagement with a contact 410 connected to the terminal K.

Let us assume that the unit 368 shown in FIGURE 9 corresponds to a count of "three" for example. Cam 396 then steps three times. Upon the third step of the shaft a projection on cam 398 acts against spring 412 to move arm 384 out of engagement with contact 382 to interrupt the holding circuit for winding 376. This action prevents winding 388 from being re-energized when arm 390 again engages contact 392 after the third count. Thus unit 368 completes its first count of three. When the unit 368 is activated the next time it operates as above and cam 398 has a projection in the sixth position to prevent re-energization of winding 388 after the sixth shaft step. Since ten, the number of steps in one revolution of cam shaft is not evenly divisible by the count number, three, rather than putting a projection in the ninth position for the third operation of the unit 368 shown in FIGURE 9, I place a projection in the tenth position so that the shaft will return to its zero position after it has counted three times. In so doing, however, I cause the unit to generate four counts during its last counting operation. To ensure that only three of these counts are applied to terminal K I place a projection on cam 400 so that just as the shaft moves into its tenth position this projection acts against spring 417 to move arm 408 out of engagement with contact 410 to interrupt the circuit from contact 406 to terminal K.

The cams 398 and 400 of the various units 368 have projections at locations corresponding to shaft positions as shown in Table I below.

Table I

Counter Weight		1	2	3	4	5	6	7	8	9	10
5	Shaft Position	Cam									
	1.....	{ 398	X								
		{ 400									
	2.....	{ 398	X	X							
		{ 400									
	3.....	{ 398	X		X						
		{ 400									
10	4.....	{ 398	X	X		X					
		{ 400									
	5.....	{ 398	X				X				
		{ 400									
	6.....	{ 398	X	X	X						
		{ 400									
15	7.....	{ 398	X					X			
		{ 400									
	8.....	{ 398	X	X							
		{ 400									
	9.....	{ 398	X				X	X			
		{ 400									
20	10.....	{ 398	X	X	X	X	X	X	X	X	X
		{ 400			X	X	X	X	X	X	X

When cam 398 acts against its spring 412 to move arm 384 out of engagement with contact 382 it moves the arm 384 into engagement with a contact 414 to apply a pulse of potential to terminal J through a diode 416 and to apply a pulse of potential to terminal L. I connect all the terminals J of the units 368 to a conductor 416 leading to the terminal D of the unit 312 to indicate that a pitch has been thrown when any one of the cords 20 is actuated.

The form of my invention shown in FIGURE 7 includes a plurality of strike scoring counter actuating units, indicated generally by the reference character 418 and shown in detail in FIGURE 10. As can be seen by reference to FIGURE 10, each of the units 418 includes a plurality of terminals M, N, O, P, Q, and R. A switch arm 420 normally in engagement with a contact 422 connects the terminals M and N of each unit 418. I connect the terminal N of the highest counting unit 418 to the conductor 374. I connect the terminal M of a higher count unit 418 to the terminal N of the next lower count unit 418. In this manner all the units 418 are normally in a condition to operate. When, however, the ball unit 312 operates to indicate that the pitch definitely is a ball, the arm 316 of this unit moves out of engagement with the contact 320 to disable all the ball-or-strike units 368 and all the strike units 418. In a similar manner if any one of the strike units 418 is operated the lower count units are disabled. I connect the switches 90 corresponding to the cords 22 to the terminals O of the units 418 through terminal board 310 in such manner as to give the desired weight to areas within the vertical extent of the strike zone. When a pitch strikes a cord 22 to close a switch 90, it energizes a winding 424 to move switch arm 420 out of engagement with contact 422 and into engagement with a contact 426 and to move a contact arm 428 out of engagement with a contact 430 and into engagement with a contact 432. The engagement of contact arm 428 with the contact 432 completes a holding circuit for the winding 424 through a cam-actuated arm 434 normally in engagement with a contact 436. A conductor 438 connects arm 434 to the terminal N which is connected to the source of potential through the circuit described above.

As has been explained hereinabove in connection with the showing of FIGURE 9, whenever the ball or strike cord 20 associated with a particular unit 368 is struck by a pitch passing through the frame 12, the unit 368 produces a number of output pulses at its terminal K corresponding to said score assigned to the particular cord. By way of example in FIGURE 10 I have shown a form of the strike counter 418 adapted to produce a count of six. As can be seen in the figure, cam 486 has a projection only in the tenth position while cam 488 has projections in the seventh, eighth, ninth and tenth positions. This is in accordance with Table I above.

I connect all the K output terminals of the units 368 to a common conductor 440. A conductor 442 connects the common output conductor 440 to a common input conductor 444 which feeds all the P input terminals of the units 418. A conductor 446 connected to all the Q terminals of the units 418 is connected to a units digit scoring indicator 448, the output of which is fed to a tens digit counter 450 which in turn supplies the input to a 100's digit counter 452. These tens units and 100's counters are constructed in a manner similar to that described hereinabove in connection with the counters shown in FIGURE 5. With one of the units 418 actuated so that arms 420 and 428 are in engagement with contacts 426 and 432, and with the pulses coming from one of the units 368 applied to the terminal P of the energized unit 418, they are conducted through a circuit including a contact 454 engaged by a switch arm 456 to the terminal Q of the unit and through conductor 446 to the counters. As has also been explained hereinabove, at the end of each counting operation of a unit 368 switch arm 384 momentarily engages contact 414 to apply a pulse both to the terminal J through crystal 416 and to the terminal L. As has also been explained hereinabove, this pulse of potential at the terminal J actuates the balls-thrown counter actuating unit 312. I connect all the output terminals L of the units 368 to a common conductor 458 which is connected to a common input conductor 460 connected to all the R terminals of the units 418. A pulse appearing at the output terminal L of a unit 368 as the unit completes its counting operation passes to the terminal R of the units 418 and through a diode 462 to energize a relay winding 464. When energized, winding 464 moves a contact arm 466 into engagement with a contact 458, moves contact arm 456 out of engagement with the contact 454 and moves a contact arm 470 into engagement with a contact 472. The engagement of the contact arm 470 with the contact 472 completes a holding circuit for winding 464 from the terminal N through arm 420 in engagement with contact 426, through arm 466 in engagement with contact 468 through a diode 474 and through contact 472 engaged by arm 470 to the winding 464. Movement of arm 456 out of engagement with contact 454 interrupts the circuit for passing ball or strike scoring impulses to the counter. Engagement of the arm 466 with the contact 468 completes a circuit through a cam operated contact arm 476 and a contact 478 to a cam stepping winding 480 adapted when energized to actuate a linkage 482 to step cams 484, 486, and 488. The circuit of winding 480 includes a resistor 479 and a capacitor 481. On each step cam 484 acts against a spring 490 to move arm 476 out of engagement with contact 478 and into engagement with a contact 492. This action applies an output pulse to the terminal Q through a contact arm 494 in engagement with a contact 496 connected to contact 454 leading to the terminal Q. When the arm 476 returns to the contact 478, another stepping operation takes place until, in the particular unit 418 shown in FIGURE 10, ten steps have been completed. When the projections of cam 488 act against a spring 498 they move arm 494 out of engagement with contact 496 so that only that predetermined number of pulses corresponding to the assigned scoring weight for the unit 418 are sent to the counter. On the occurrence of the tenth step cam 486 acts against a spring 500 to move arm 434 out of engagement with contact 436 to interrupt the holding circuit of winding 424 and 464 to permit the unit to reset. Thus areas within the strike zone may be assigned various scoring weights. I provide the form of my invention shown in FIGURE 7 with reset switches 502 and 504 which respectively may be closed to reset the balls thrown counters 346 and 352 as well as the scoring counters 448, 450, and 452 in a manner similar to that described with the showing of FIGURE 5.

It is to be understood that while I have described my

invention in terms of the actuation of signal cords, it may be that a pitch passing through the frames 12 and 14 may actuate more than one cord in either of the frames at a time. In this event only that cord which is closer to the center of the strike zone registers.

In operation of the form of my invention shown in FIGURES 1 to 5, a pitch passing through the frame 12 and striking a ball cord 18 energizes the winding 94 to cause a ball to be registered on the individual hypothetical batter ball counter indicator 150 and to cause a ball to be registered on the total balls counter indicators 182 and 192. If a pitch passing through the frame 12 strikes a ball-or-strike cord 20, it energizes relay winding 96 to begin to energize the winding 122. If before energization of this winding is complete the pitch strikes a cord 22 in frame 14, then winding 98 is energized to prevent energization of winding 122 and to energize winding 222 to cause a strike to register on counter indicator 234 and on counter indicators 270 and 280. If no cord 22 is struck by a pitch passing through frame 14, then winding 122 is energized to register a ball in the same manner as is done when a cord 18 is actuated.

In the operation of the form of my invention shown in FIGURES 7 to 10 if a pitch passing through the frames 12 actuates a cord 18, then a switch 86 actuates the unit 312 to cause the counter 346 to register the fact that a ball has been thrown. If a pitch thrown toward my device actuates a cord 20 in the course of its passage through frame 12, then a switch 88 closes to activate the unit 368 to which this switch 88 is connected to cause the unit 368 to begin its count. If this pitch fails to strike a cord 22 in the course of its passage through frame 14, then the count of the unit 368 is not passed to the scoring counters 448, 450, and 452. If however after having struck a cord 20 in its passage through frame 12 a pitch then strikes a cord 22 as it passes through frame 14, a switch 90 is actuated to activate one of the units 418 with which the switch is associated. The activated unit 418 first passes the count of the activated unit 368 to the scoring indicators 448, 450, and 452 and then passes its own count to the scoring indicators. In this matter the indicators register a score for the pitch which is that score corresponding to the part of the strike zone through which the pitch passed.

It will be seen that I have accomplished the objects of my invention. I have provided a baseball pitching practice device which defines the extent of a strike zone with a high degree of accuracy. My device has a very long life in that it does not require a pitch to be arrested in order that the actuatable means of the device be operated. My pitching practice device is very flexible in that it may be set up either to register merely balls and strikes or to register a score depending upon the particular part of the strike zone through which a pitch passes. My device is relatively simple in construction for the result achieved.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of my claims. It is further obvious that various changes may be made in details within the scope of my claims without departing from the spirit of my invention. It is, therefore, to be understood that my invention is not to be limited to the specific details shown and described.

Having thus described my invention, what I claim is:

1. A baseball pitching practice device for scoring in response to the passage of a pitch thrown toward the device through a strike zone having a vertical extent and a lateral extent including in combination respective laterally spaced first actuatable means for defining the lateral extent of the strike zone, respectively vertically spaced second actuatable means for defining the vertical extent of said strike zone, means mounting the first and second actuatable means one behind the other in the path of pitches to define said strike zone, a plurality of first

counting means adapted to be energized to generate respective counts, a plurality of second counting means adapted to be energized to generate respective counts, means connecting the first actuatable means to said first counting means, means connecting said second actuatable means to the second counting means, and means responsive to the sequential actuation of a first actuatable means and a second actuatable means for totalizing the counts provided by the respective corresponding counting means associated with the first and second actuatable means.

2. A baseball pitching practice device for scoring in response to the passage of a pitch thrown toward the device through a strike zone having a vertical extent and a lateral extent including in combination respective laterally spaced first actuatable means for defining the lateral extent of the strike zone, respective vertically spaced second actuatable means for defining the vertical extent of said strike zone, the extent of one of said actuatable means having a portion outside said strike zone, means mounting the first and second actuatable means one behind the other in the path of pitches to define said strike zone, a plurality of first counting means adapted to be energized to generate respective counts, a plurality of second counting means adapted to be energized to generate respective counts, means connecting the first actuatable means to the first counting means, means connecting said second actuatable means to the second counting means, means responsive to the sequential actuation of a first actuatable means and a second actuatable means for totalizing the counts provided by the respective corresponding counting means associated with the first and second actuatable means and means responsive to the actuation of only one of said actuatable means for preventing the registration of the count of the associated counter.

3. A baseball pitching practice device for scoring in response to the passage of a pitch thrown toward the device through a strike zone having a vertical extent and a lateral extent including in combination respective laterally spaced first actuatable means for defining the lateral extent of the strike zone, respective vertically spaced second actuatable means for defining the vertical extent of said strike zone, means mounting the first and second actuatable means one behind the other in the path of pitches to define said strike zone, a plurality of first counting means adapted to be energized to generate respective counts, a plurality of second counting means adapted to be energized to generate respective counts, means connecting the first actuatable means to the first counting means, means connecting said second actuatable means to the second counting means, means responsive to the sequential actuation of a first actuatable means and a second actuatable means for totalizing the counts provided by the respective corresponding counting means associated with the first and second actuatable means, third actuatable means for defining areas outside said strike zone, third counting means and means responsive to said third actuatable means for energizing said third counting means.

4. A baseball pitching practice device for scoring in response to the passage of a pitch thrown toward the device through a strike zone having a vertical extent and a lateral extent including in combination respective laterally spaced first actuatable means for defining the lateral extent of the strike zone, respective vertically spaced second actuatable means for defining the vertical extent of said strike zone, means mounting the first and second actuatable means one behind the other in the path of pitches to define said strike zone, a plurality of first counting means adapted to be energized to generate respective counts, a plurality of second counting means adapted to

be energized to generate respective counts, means connecting the first actuatable means to the first counting means, means connecting said second actuatable means to the second counting means, means responsive to the sequential actuation of a first actuatable means and a second actuatable means for totalizing the counts provided by the respective corresponding counting means associated with the first and second actuatable means and means responsive to operation of said actuatable means for counting the total number of strikes.

5. A baseball pitching practice device for indicating that a pitch thrown toward said device is a strike or a ball with reference to a strike zone defined by an extent in a lateral direction and by an extent in a vertical direction including in combination first actuatable means having an extent in one of said directions greater than the corresponding strike zone extent, second actuatable means having an extent in the other direction substantially equal to said strike zone extent, means mounting said first and second actuatable means in the path of pitches to define said strike zone, means responsive to the sequential actuation by a pitch of said respective actuatable means for indicating that said pitch is a strike, means responsive to actuation by a pitch of said first actuatable means in its extent outside said strike zone in said one direction for indicating that said pitch is a ball, means responsive to said sequential actuation indicating means for counting the total number of said strikes, and means responsive to said other indicating means for counting the total number of said balls.

6. A baseball pitching practice device for indicating that a pitch thrown toward said device is a strike or a ball with reference to a strike zone defined by an extent in a lateral direction and by an extent in a vertical direction including in combination first actuatable means having an extent in one of said directions greater than the corresponding strike zone extent, second actuatable means having an extent in the other direction substantially equal to said strike zone extent, means mounting said first and second actuatable means in the path of pitches to define said strike zone, means responsive to the sequential actuation by a pitch of said respective actuatable means for producing a first signal, means responsive to the actuation by a pitch of said first actuatable means at a location outside said strike zone in said one direction for producing a second signal, first means responsive to said first signal for indicating the number of strikes pitched to any individual hypothetical batter, second means responsive to said first signal for indicating the total number of strikes thrown during a practice session, third means responsive to said first and second signals for indicating the number of balls thrown to an individual hypothetical batter and fourth means responsive to said first and second signals for indicating the total number of balls thrown during a practice session.

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