

1,000,039.

4 SHEETS—SHEET 1.



Howard D. Cox.
H. H. Riley.

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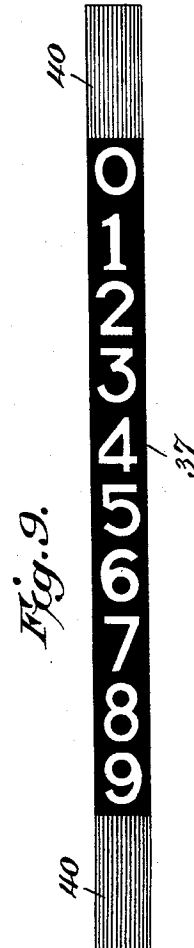
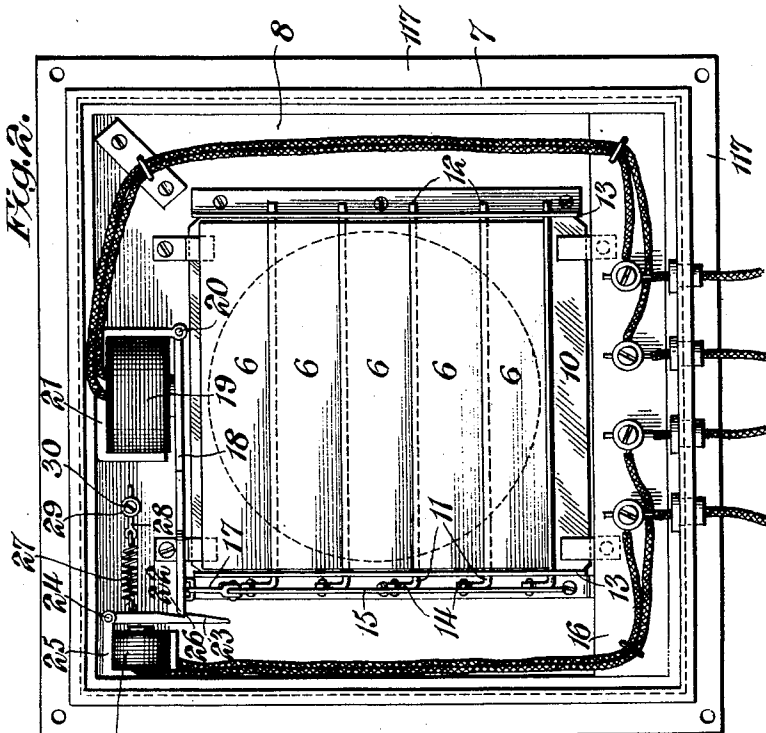
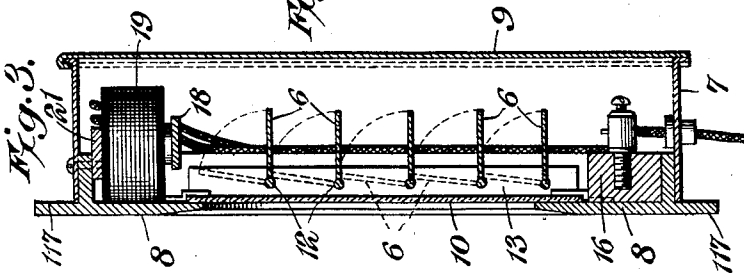
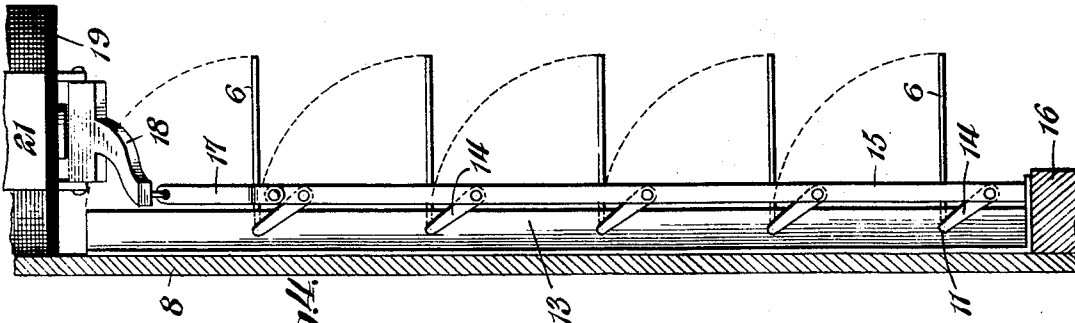
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S. A. REDDING.
ELECTRICALLY OPERATED SCORE BOARD.
APPLICATION FILED JUNE 9, 1909.

1,000,039.

Patented Aug. 8, 1911.

4 SHEETS—SHEET 2.



Witnesses

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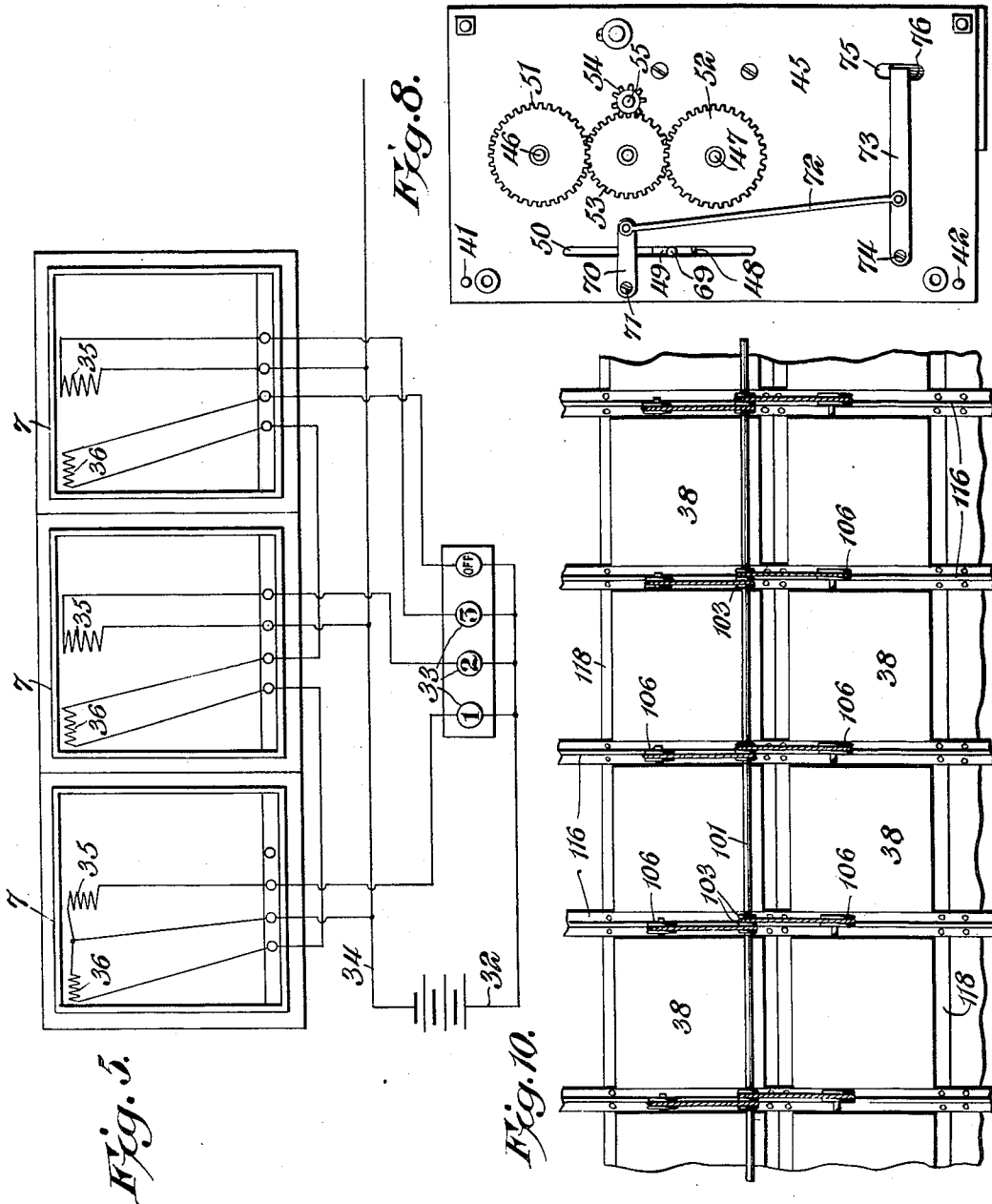
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4 SHEETS—SHEET 3.



Witnesses

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1,000,039.

4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

SAMUEL ARTHUR REDDING, OF ATLANTA, GEORGIA.

ELECTRICALLY-OPERATED SCORE-BOARD.

1,000,039.

Specification of Letters Patent.

Patented Aug. 8, 1911.

Application filed June 9, 1909. Serial No. 501,047.

To all whom it may concern:

Be it known that I, SAMUEL A. REDDING, a citizen of the United States, residing at Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Electrically-Operated Score-Board, of which the following is a specification.

The invention relates to an electrically operated score board.

The object of the present invention is to provide a simple and comparatively inexpensive electrically operated score board, equipped with character and number signals, adapted for making announcements at games of amusements, such as base ball, foot ball, tennis, horse races, etc., and capable also of use in various lines of business and elsewhere for transmitting at a distance orders or messages of any character.

With these and other objects in view, the invention consists in the construction and novel combination of parts hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the claims hereto appended; it being understood that various changes in the form, proportion, size and minor details of construction, within the scope of the claims, may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings:—Figure 1 is a diagrammatic view, illustrating a base ball score board and a key board, constructed in accordance with this invention. Fig. 2 is a rear elevation of one of the character signals and the operating mechanism therefor. Fig. 3 is a vertical sectional view of the same. Fig. 4 is an enlarged sectional view of the character signal, illustrating the construction for connecting the pivoted slats with the armature of the signal actuating electro-magnet. Fig. 5 is a diagrammatic view of the wiring of a group of three of the disk signals. Fig. 6 is an enlarged detail view, illustrating the construction of the number signals. Fig. 7 is a vertical sectional view of the same. Fig. 8 is a side elevation of one of the number signals. Fig. 9 is a plan view of one of the flexible number bearing strips. Fig. 10 is a detail view of a portion of the frame-work.

Like numerals of reference designate corresponding parts in all the figures of the drawings.

In the embodiment of the invention illus-

trated in the accompanying drawings, the score board 1 is designed for use at a base ball field or park for announcing the details and result of a game of base ball, as the same is played on the said field, and also for announcing the runs and the score by innings of other games simultaneously played by other clubs of any league or association of which the clubs using the score board constitute a part, but the score board may be changed and the signal units may be employed either singly or associated with each other for other games, and for making announcements for any other purpose, either on land, or at sea, as the signals can be employed as a means of communication between the various ships of a fleet, passing ships, or between a ship and a shore or other station. In practice the surface of the score board will be black and the signals will appear in white, but for convenience of illustration in the accompanying drawings, the signals are shown in black on white surfaces.

The score board is provided at the top with a space 2 for a suitable heading, which may consist of the name of the home base ball club and the words "Official Score Board." It is provided with a "Details" column 3, which is preferably located at the left hand side of the score board. In this column such details of the game as "balls," "strikes" and "outs" are indicated by disk signals 4, and the number of "runs" is indicated by the numeral signal 5. Although only disk shaped signals and numeral signals are illustrated in the accompanying drawings, yet it will be apparent that other forms of signal than disks may be used, and that letters may be substituted for the numerals. At the top of the "Details" column immediately below the word "Details" appears the word "balls" and under the same is a row of disk signals 4, which are three in number for indicating that either one, two or three balls have been called on the pitcher. Should the next ball be called on the pitcher, the batter will take his position at the first base, and the signals indicating the "balls" and "strikes" will be erased by the means hereinafter described. A series or group of two disk signals is employed for indicating the number of "strikes," two being all that is necessary as the player quits the bat when the three strikes have been called against him.

Each of the disk signals comprises a se-

ries of pivotal slats 6, mounted within a rectangular casing 7 and adapted to be opened and closed to arrange them either edgewise or flatwise with respect to the aperture. The casing, which is constructed of metal, or other suitable material, has a front wall or member 8, provided with a circular opening for exposing a circular portion of the slats to display a disk signal, but by changing the form of opening the shape of the signal may be varied. The casing is also provided with top, bottom and side walls, and it has a rear wall or back 9. The front wall is provided at the opening with a plate or pane 10 of glass, or other suitable transparent material. The pivotal slats, which are adapted to be arranged in a vertical position to display the signal and in a horizontal position to erase or remove the signal, are provided at their lower edges with pivots 11 and 12, mounted in suitable perforations of flanges 13, preferably consisting of angle strips secured to the inner face of the front wall of the casing at opposite sides of the circular opening. The slats are also provided with crank arms 14, preferably formed by extensions of the pivots 12 and connected with a vertical bar 15, which causes the slats to move in unison. The vertical connecting bar is adapted to support the slats in a horizontal position with their pivoted edges disposed toward the front of the score board, as illustrated in Figs. 3 and 4 of the drawings, and when viewed in this position, they are invisible at a distance. The rear wall or back 9 of the casing forms a plain background, which is exposed when the slats are arranged edgewise. The surfaces or faces of the slats exposed by swinging the slats upward from the horizontal position, illustrated in Fig. 3 to the vertical position shown in Fig. 2, are white while the casing is black. This will cause a white disk to be displayed on a black surface or background, thereby producing a signal, which may be distinctly seen from a considerable distance. The casing is provided at the bottom with an interiorly arranged horizontal bar 16 of wood, or other suitable material, adapted to limit the downward movement of the connecting bar 15 and forming a support for the same. The bar 16 also furnishes convenient means for mounting the binding posts of electrical connections, hereinafter described. The upper end of the bar 15 is connected by a short link 17 with the outer portion of an armature 18 of an electro-magnet 19, arranged at the center of the top of the casing. The armature 18 is pivoted at its inner end 20 to a bracket 21, in which the electro-magnet is mounted. The outer end 22 of the armature 18 extends beyond the link 17, and is arranged to be automatically engaged by a latch 23, pivoted at its upper end 24 to a bracket 25, or other suitable

support and having a beveled or tapered lower portion and provided at the upper end of the tapered portion with a recess, forming a shoulder 26 for engagement with the outer end of the armature 18. The pivoted latch, which is approximately vertical, is connected at its upper portion with a horizontally disposed coiled spring 27, secured at the outer end to an eye of the vertical latch and connected at its inner end with a pin 28, which is adjustably secured in an opening of a stud 29 by a clamping screw 30. The pin 28 is adjusted longitudinally to vary the tension of the spring, which urges the latch toward the armature 18, and causes the latch to automatically engage the same, when the armature is actuated by the electro-magnet to swing the slats 6 upward for displaying the signal, formed by the same. By this construction, it is only necessary to depress for an instant the button connected with the electro-magnet, as the signal circuit hereinafter described will be closed and the electro-magnet 19 energized. The latch 23 maintains the disk signal displayed until the same is released by a latch operating electro-magnet 31, disposed horizontally and mounted in the bracket 25. The electro-magnet 31 is located at the outer side of the latch 23, and when energized attracts the latch, which constitutes the armature of the electro-magnet 31. The energizing of the electro-magnet 31 swings the latch outward withdrawing the shoulder thereof from engagement with the armature 18 and permitting the slats to drop by gravity to their horizontal position. This erases or removes the disk signal from the score board. An instant's depression of the release button is sufficient to permit the slats of the disk signal to swing downward to their horizontal or unexposed position.

The wiring of a group of three of the disk signals is illustrated in Fig. 5 of the accompanying drawings. In this particular arrangement they would be the series of disk signals employed for indicating "balls." One side 32 of the battery wire extends to the push buttons 33, while the other side 34 of the battery wire is common to one end of each of the vertical coils 35, which represent the vertical electro-magnets for displaying the disk signals. The wires at the opposite end of each of the said coils 35 run to the buttons. The horizontal coil 36 of three boxes or casings represent the horizontal latch operating electro-magnets, and are connected in series; the first on the left is connected to the common battery wire through the medium of the wire which connects the first vertical coil with the battery wire 34, and the wire from the last on the right runs to the knock-off button. When the knock-off button is depressed, the latch releasing circuit is closed and each of the electro-

magnets thereof is energized, so that one or all of the signals may be erased or removed from the board by a single pressing of the said knock-off button. The wiring of a group of two of the disk signals would be the same as that illustrated in Fig. 5 with the omission of the intermediate box or casing, and the wiring of an increased number of signals would be the same as that illustrated in Fig. 5 of the drawings, the only change consisting in the duplication of the wiring of the intermediate box or casing. In a score board for base ball, it is not necessary to employ a larger group than three, but in other games or for other purposes, it may be desirable or advantageous to employ larger groups of signals.

The number signal 5, which shows the number of "runs" made during an inning, consists of a flexible strip or belt 37, bearing a series of numerals from naught to nine, which are adapted to be successively exposed at the front of a rectangular casing 38, constructed of metal or other suitable material and provided at the front with an aperture, covered with a plate or pane 39 of glass, or other transparent material. The casing presents a black appearance similar to the casing of the disk signals, and the numbers are preferably white and are arranged on a black surface, as clearly illustrated in Fig. 9 of the drawings, although any color may be employed for the signals and the background for the same.

Letters may be substituted for the numerals, and the strips may be increased in length to accommodate the desired number of characters. The end portions 40 of the flexible strip are red for about a distance of two feet and operate as danger signals, which, as hereinafter explained, will be displayed in case the operator through carelessness presses any of the controlling buttons too long, or in case a button gets out of order. Should the button remain depressed even after the red portion of the belt appears, the mechanism will finally cut itself out automatically without damage, as hereinafter fully explained.

The flexible strip, which has a stretch or portion exposed at the opening at the front of the casing, is arranged on upper and lower guide rolls 41 and 42, and the terminal portions of the flexible strip are wound around upper and lower winding rolls 43 and 44. The rolls are journaled in suitable bearings of a supporting frame 45, which is suitably mounted within the casing 38. The upper and lower guide rolls 41 and 42, which are of relatively small diameter, are provided with journals, which are arranged in bearing openings of the sides of the frame 45, and the winding rolls 43 and 44, which are relatively large, are provided with terminal flanges and are mounted on suitable

shafts 46 and 47, which are journaled in bearings of the sides of the frame. As the flexible strip is reeled from one winding roll onto the other, the rolled up portions of the flexible strip vary in size, and as the rolls are driven at the same rate of speed by the means hereinafter described, the winding and the unwinding of the flexible strip is not uniform, and in order to compensate for this to avoid stretching or tearing the flexible connection, a tension loop 48 is formed between the upper guide roll 41 and the upper winding roll 43. The tension loop 48 receives a weighted tension roll 49 having suitable journals or gudgeons, arranged in vertical slots 50 of the sides of the supporting frame 45. The weighted tension roll maintains the front vertical stretch or portion taut at the front of the casing, and it takes up any slack in the flexible strip, and at the same time it is adapted to permit the same to yield when it is wound up on one of the winding rolls more rapidly than it is unwound from the other winding roll.

The shafts 46 and 47 are extended through one of the sides of the frame 45, and carry upper and lower spur gears 51 and 52, which mesh with an intermediate gear 53, adapted to uniformly rotate the upper and lower gears 51 and 52 in the opposite direction, so that the flexible strip will be wound around one of the winding rolls and unwound from the other, when the intermediate gear is rotated in either direction. The intermediate gear is driven by a pinion 54, mounted on the shaft 55 of a friction roll 56. The friction roll 56, which is arranged horizontally, extends across the supporting frame at a point between the upper and lower winding rolls 43 and 44, and it is located adjacent to a motor driven friction roll 57. Motion is communicated from the motor driven friction roll 57 to the friction roll 56 through a rubber covered electrically controlled friction roll 58, located above the friction rolls 56 and 57 and mounted on a suitable shaft 59, which is journaled in a vertically movable frame or support 60, composed of spaced vertical rods 61, guided in alined openings of spaced upper and lower horizontal bars 62 and 63 and connected at their lower ends by a cross bar 64, carrying a depending armature 65 of an iron bound electro-magnet 66. The horizontal bars 62 and 63 are suitably secured at their terminals to the sides of the frame 45, and the friction roll 58 is normally supported above and out of contact with the friction rolls 56 and 57 by coiled springs 67, located between the spaced horizontal bars 62 and 63 and bearing against the lower bars 63 and engaging pins 68, or other suitable devices carried by the vertically movable rods 61. The coiled springs normally maintain the upper friction roll

58 in spaced relation with the friction rolls 56 and 57. When the electro-magnet 66 is energized, it attracts the armature and draws the frame 60 downward against the action of the springs 67, and holds the friction roll 68 in contact with the rolls 56 and 57. The switch board button, which is connected with the electro-magnet, is held depressed until the winding rolls are rotated a sufficient distance to display the desired number at the front of the casing. In practice the casings of all the signals will be one foot square, and if zero is desired about a second and a half will be required to produce it. If the numeral "1" is desired double this time is necessary, and so on up to the numeral "9," which is the last on the strip. As soon as the number desired by the operator appears at the front of the casing, the push button is released, and the coiled springs instantly operate to carry the upper friction gear out of engagement with the other friction gears. All of the friction rolls, if desired, may be rubber covered, and other forms of gear elements may be substituted for the friction rolls, if desired.

Should; through any cause the friction gear 58 remain in contact with the other friction gears, the movement of the flexible strip from one winding roll to the other will continue until the flexible strip is entirely unwound from one of the winding rolls, the further rotation of the winding rolls will then contract the tension loop 48 and raise the tension roll. One of the gudgeons or journals 69 of the tension roll is extended, and an upper horizontal lever 70 of the switch operating mechanism is arranged in the path of the journal or gudgeon 69. The upper lever 70, which extends across the slot 50, is pivoted at its outer or front end 71, and its inner or rear end is connected by a rod 72 with a lower lever 73, arranged horizontally and pivoted at its front end 74. The lower end of the rod 72 is connected with the lever 73 at an intermediate point, and the rear end of the lower lever 73 is bent at right angles and extends through a slot 75 of the adjacent side of the casing, and is connected by a block or piece 76 of insulating material with a resilient switch arm or member 77 of a switch in the signal circuit. When the continued upward movement of the tension roll 49 through the overwinding of the flexible strip carries the extended gudgeon 69 into engagement with the upper lever 70, the latter is raised and the resilient arm or member 77 of the switch is lifted out of contact with the button or terminal 78. The opening of the switch breaks the circuit and cuts out the signal, which must be reset by hand. The connecting block or piece 76 is bifurcated at its upper portion to receive the angularly bent rear end of the lower horizontal lever, and

its lower end carries a depending headed fastening device 79, which is engaged with a slot or bifurcation 80 by the free end of the resilient arm or member 77 of the switch.

The score board is provided with a "Clubs" column 81, equipped at intervals with hooks 82, arranged in sets and adapted to support sign plates 83, provided at their upper edges with eyes to receive the hooks. The sign plates are disposed in pairs and are designed to bear the names of the contesting clubs, the pairs being spaced apart a greater distance than the members of each pair of the sign plates. The sign plates or name plates are detachable and interchangeable, and are also reversible to present either face to the front, the rear face of each sign or main plate being designed to bear the word "Rain" or "No game" or a similar expression for indicating the fact that there has been no game on account of rain, or other cause. The "Clubs" column is preferably located contiguous to the inner margin of the "Details" column, and the space to the right of the "Clubs" column is divided into vertical "Innings" columns 84, numbered one to ten, the numbers of the columns being permanent and arranged at the top of the same. The "Innings" columns contain and are intersected by rows of numeral signals 85, constructed similar to the numeral signal 5, a row being provided for each of the clubs, whose names appear in the "Clubs" column. A "Total" column 86 is arranged at the right hand end of the series of innings columns and is of double the width thereof to accommodate a pair of numeral indicators, in order that a number including two figures may be displayed for indicating the total number of "runs" made by a club. The lower portion of the score board bears a horizontal row of numerals 87, ranging from one to twenty-four, and over the row are the words "Numbers represent names of players", while under the row 87 of numbers is a horizontal row 88 of disk signals, a disk signal being associated with and corresponding to each of the numbers of the row 87. Immediately beneath the row 88 of the disk signals are the words "Disk indicates player at bat". The names of the umpires are also designed to be presented on removable sign plates or name plates 89, provided at their upper edges with eyes and suspended from the board by hooks 90, which engage the eyes. The word "Umpires" appears in front of the left hand name or sign plate 89, "And" is placed on the score board between the sign or name plates 89.

By reference to Fig. 1 of the drawings, it will be seen that the game has just passed the fourth inning. There are two "balls" and one "strike" called on the batter, who is No. 9, and the name of any player repre-

5 sent by any number will be shown on the
 printed score card given out in the grand
 stand. One "out" has been called and two
 "runs" have been made. Should the next
 10 ball thrown by a pitcher be a "strike" a sec-
 ond disk under the word "Strikes" will be
 made to appear. If a "ball", a third disk
 under the word "Balls" will show up.
 After the third "out" is made, the "balls,"
 15 "strikes" and "outs" will be erased or re-
 moved from the score board, and the "runs"
 transferred from the "Details" column to
 the score by innings. The score board is de-
 signed to be operated from the press box
 20 by the official scorer or his assistant, and the
 operating or key board 91 will be a minia-
 ture, in general appearance of the large
 score board 1. Where the disks appear on
 the large score board, push buttons 92 will
 25 occupy corresponding positions on the key
 board. Also where numbers appear for
 "Runs" and "Score by innings" on the
 score board, push buttons 93 and 94 will ap-
 pear on the key board. There will also be
 30 nine other push buttons 94^a, 95, 96, and 98
 on the key board to be used for erasing or
 removing the "balls", "strikes", "outs"
 and groups of disks representing the players
 at bat. As the operating board is practi-
 35 cally a reproduction of the regular score
 board, it is a very simple matter to operate
 the apparatus. Each of the electro-magnets
 used for throwing a signal into view has a
 corresponding button on the operating
 40 board, but in the case of the latch operating
 electro-magnet, two or more are connected
 in series, and have only one button for each
 series. The number signals are operated
 by an electric motor 99, motion being trans-
 45 mitted from the motor shaft 100 to the fric-
 tion rolls 57 by gearing hereinafter de-
 scribed. Each individual numeral signal is
 controlled through its electro-magnet 66,
 which has a corresponding button on the
 50 key board. The wiring of the numeral sig-
 nal circuits is indicated in Fig. 1 of the
 drawings. One side of the battery wire is
 connected with the push button, and the
 other side extends to one end of the coil of
 55 the electro-magnet, the armature of which is
 connected with the movable gear element.
 The wire from the other end of the coil of
 such electro-magnet runs to the push button.
 The battery wire is common to the several
 60 circuits, and one battery from eight to fif-
 teen cells will operate every signal on the
 score board. A line shaft 101 is provided
 for each two rows of numeral signals, as
 clearly illustrated in Fig. 1 of the drawings,
 and these line shafts are connected by belt
 and pulley connections 102 with the motor
 65 shaft, but other forms of gearing may be
 employed for transmitting motion from the
 motor shaft to the line shafts. Each line
 shaft 101 is equipped with pulleys 103, and

is connected by upwardly and downwardly
 extending belts 104 and 105 with pulleys
 106 and 107 of the adjacent sets of numeral
 signals. When the motor is started, the
 outer friction roll 57 of each number signal
 is rotated, and any one of the number sig- 70
 nals may be displayed or changed by press-
 ing the corresponding push button and
 holding the same until the desired number
 appears on the score board.

75 A double pole double throw switch 108 is
 employed. Two of the wires 109 and 110
 from the source of current supply run to
 the lower binding posts of this double pole
 double throw switch 108, and two of the 80
 wires 111 and 112 from the operating motor
 run to the middle binding post of the switch
 108. A third wire 113 from the source of
 current supply runs direct to the third ter-
 minal of the motor. The wires 114 and 115 85
 of the switch are crossed between the lower
 and the upper binding posts, and it will be
 seen that by throwing the switch to an up-
 per position, two of the wires are reversed,
 and in this way the direction of rotation of 90
 the motor is changed. The reversal of the
 direction of rotation of the motor enables
 the flexible strip to be rewound on the lower
 roll from which the flexible strip is first
 unwound, but the strip may be reversed if 95
 desired. Also the reversal of the motor will
 enable the strip to be run back to the proper
 number should a wrong number be displayed
 through accident or mistake. To operate
 100 any particular signal unit on the score
 board, it is only necessary to press the cor-
 responding button on the operating board
 and release the button as soon as the disk or
 number appears.

105 The frame of the score board, which may
 be made of any suitable material, can be ad-
 vantageously constructed of flanged metallic
 bars 116, suitably connected and forming
 rectangular openings to receive the signal
 casings, which are provided at the front 110
 with suitable attaching flanges 117 and 118.
 The signal casings are fitted in the rectan-
 gular openings, and the attaching flanges
 117 and 118 are bolted or otherwise secured
 to the frame-work of the score board. In 115
 practice the score board will be suitably in-
 closed at the sides and back, and will be
 provided with a flexible curtain or closure
 consisting of metallic slats or bars and de-
 signed to be operated by the motor. 120

Having thus fully described my invention,
 what I claim as new and desire to secure by
 Letters Patent, is:—

1. In an apparatus of the class described,
 the combination of a score board having a 125
 plurality of apertures at the front and a
 plain background in rear of and spaced
 from the apertures, a series of thin slats lo-
 cated at each of the apertures and arranged
 between the said aperture and the back- 130

ground and movable in unison to arrange them edgewise in a non-signaling position and expose the background and flatwise to form a signal, means for stopping the slats in their edgewise position, a key board consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons and the slats including actuating means for the latter.

2. In an apparatus of the class described, the combination of a score board having a plurality of apertures at the front, and a plain background in rear of and spaced from the apertures, a series of thin slats connected together and arranged in the space between each of the apertures and the background, each slat being of a width less than the diameter of the aperture while the combined widths of the slats exceed the diameter of the aperture, means for moving the slats in unison to arrange them flatwise in substantially the same plane to form a signal and edgewise in a non-signaling position to expose the background, means for stopping the slats in their movement to maintain them in their edgewise position, a key board consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons and the means for moving the slats.

3. In an apparatus of the class described, the combination of a score board having at the front a plurality of apertures of the conventional shape used in base ball scoring, and a plain background in rear of and spaced from the apertures, a series of thin slats arranged between each of the apertures and the background and movable upwardly in unison to a flatwise position to form a signal and movable downwardly therefrom by gravity to a horizontal edgewise non-signaling position to expose the background, means for stopping the slats in their downward movement to support them in their edgewise position, a key board consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons and the slats including actuating means for the latter.

4. In an apparatus of the class described, the combination of a score board provided at the front with a plurality of apertures of the conventional shape used in base ball scoring and having a plain background in rear of and spaced from the apertures, a plurality of thin slats arranged between each of the apertures and the background and horizontally pivoted and movable upwardly and downwardly in unison to arrange them flatwise to form a signal and edgewise in a non-signaling position to expose the background, said slats being provided at the pivots with crank elements, a rod connected to each of the crank elements, means including an electro-magnet having

an armature connected with the rod for actuating the slats, means for stopping the slats in their downward movement to support them in their edgewise position, a key board consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons and the electro-magnets of the slat actuating means.

5. In an apparatus of the class described, the combination of a score board provided at the front with a plurality of apertures of the conventional shape used in base ball scoring and having a plain background in rear of and spaced from the apertures, a plurality of thin horizontally pivoted slats arranged between each of the apertures and the background and having crank elements and movable upwardly in unison to arrange them flatwise to form a signal and downwardly therefrom to a horizontal edgewise non-signaling position to expose the background, a vertical rod connected with the crank elements and arranged to stop the downward movement of the slats to support the same in their edgewise position, means including an electro-magnet having an armature connected with the rod for actuating the slats, a latch arranged to engage the armature, means for operating the latch to release the armature, a key board consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons, the electro-magnets of the slat actuating means and the latch operating means.

6. In an apparatus of the class described, the combination of a casing provided at the front with a plurality of apertures and having a black background in rear of and spaced from the apertures, thin slats pivoted horizontally between each of the apertures and the background and movable upwardly and downwardly to arrange them flatwise to form a signal and edgewise in a non-signaling position to expose the background, the exposed faces of the said slats being painted in a light color, a rod connected with the slats for causing the same to move in unison and arranged to support the slats in edgewise relation with the aperture, means including an electro-magnet having an armature connected with the rod for actuating the slats to arrange them in their edgewise position, a key board consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons and the electro-magnets of the slat actuating means.

7. In an apparatus of the class described, the combination of a casing provided at the front with a plurality of apertures of the conventional shape used in base ball scoring and having a plain background arranged in rear of and spaced from the apertures, a se-

ries of thin slats arranged between each of the apertures and the background and horizontally pivoted at one edge and movable upwardly and downwardly in unison to arrange them flatwise to form a signal and edgewise in a non-signaling position to expose the background, said slats being adapted to swing downwardly by gravity, a rod connected with the slats and extending below the same to support the slats in an open edgewise position, an electro-magnet located above the series of slats and having an armature connected with the rod, a latch arranged to automatically engage the armature for locking the slats in their closed position, a key board consisting of a miniature of the score and having push buttons, and electrical connections between the push buttons, the electro-magnets and the latch, said connections including means for operating the latch to release the armature.

8. In an apparatus of the class described, the combination of a score board provided at the front with a plurality of apertures of the conventional shape used in base ball scoring and having a vertical background arranged in rear of and spaced from the apertures, a series of thin slats located between each of the apertures and the background and horizontally pivoted at one edge and movable upwardly and downwardly in unison to arrange them flatwise to form a signal and in a horizontal edgewise non-signaling position to expose the background, a rod connected with the slats and extending below the same to support the slats in their edgewise position, an electro-magnet located above the slats and having an armature located above the rod, a second electro-magnet forming a latch for engaging the armature of the first electro-magnet to retain the slats in their closed position, a key board consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons and the said electro-magnets for actuating the slats and for operating the latches.

9. In an apparatus of the class described, the combination of a score board provided at the front with a plurality of apertures of the conventional shape used in base ball scoring and having a plain background located in rear of the apertures, a series of thin slats pivoted horizontally between each of the apertures and the background and movable upwardly and downwardly in unison to arrange them flatwise to form a signal and in a horizontal edgewise non-signaling position to expose the background, said slats being adapted to swing downwardly by gravity to their edgewise position, a rod connected with the slats and having an engaging portion to support the slats in their edgewise position, an electro-magnet located above the slats and having an armature connected with

the rod, a second electro-magnet forming a latch for engaging the armature of the first electro-magnet for retaining the slats in their closed position, an adjustable spring connected with the latch armature for normally urging the same into engagement with the other armature, a key board consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons and the electro-magnets.

10. An apparatus of the class described including a casing having an aperture, a flexible strip provided at an intermediate portion of its length with characters and having terminal signal portions for indicating the ends of the strip, winding elements connected with the terminal portions of the strip, said terminal signal portions being of a length to be exposed at the said aperture before the flexible strip is entirely unwound from the said elements, and means for operating the winding element.

11. An apparatus of the class described including a casing having an aperture, a flexible strip having an intermediate black portion bearing white characters, said strip being also provided with terminal red signal portions, winding elements connected with the terminal portions of the flexible strip, said terminal signal portions being of a length to be exposed at the said aperture before the flexible strip is entirely unwound from the said elements, and means for operating the winding elements.

12. An apparatus of the class described including a motor actuated gear element, a flexible strip having suitable characters, rolls for the flexible strip, gearing for operating the rolls, a movable gear element normally arranged out of contact with both the motor actuated element and the gearing, and electrical means including an electro-magnet connected with the movable gear element for moving the same to a position for communicating motion from the motor actuated element to the said gearing.

13. An apparatus of the class described comprising a motor actuated gear element, a flexible strip having suitable character rolls for the flexible strip, gearing for operating the rolls, a movable gear element normally arranged out of contact with both the motor actuated element and the gearing, and electrical means including an electro-magnet connected with the movable gear element for moving the same to a position for communicating motion from the motor actuated element to the said gearing, and springs for carrying the movable gear element out of engagement with the motor actuated gear.

14. In an apparatus of the class described, the combination of winding elements, a flexible strip provided with characters and hav-

ing its terminals connected with and adapted to be wound around the winding elements, means for operating the latter including an electric circuit having a switch, and means actuated by the flexible strip for operating the switch for automatically throwing the signal out of operation when the strip is entirely unwound from either of the winding elements.

15 15. An apparatus of the class described including winding elements, a flexible strip provided with characters and having its terminals connected with and adapted to be wound around the winding elements, means for displaying a portion of the said strip, the latter being provided with a tension loop, yieldable means engaging the tension loop to maintain the strip taut between the winding elements, means for operating the latter, and means operated by the said yieldable means for automatically throwing the signal out of operation.

16. An apparatus of the class described including a signal consisting of a flexible strip provided with characters, upper and lower spaced guiding rolls, spaced winding rolls having the terminal portions of the flexible strip attached to them, said flexible strip being provided with a tension loop, a tension roll supported by the tension loop, and means operated by the tension roll for throwing the signal out of operation.

17. In an apparatus of the class described, the combination of a score board comprising a plurality of casings, each having an aperture at the front of a diameter less than the casing and of the conventional shape employed in base ball scoring and provided in rear of the aperture with a plain background, a series of slats arranged in each of the casings between the aperture and the background and movable in unison to arrange them edgewise to expose the background and flatwise to form a signal, means for stopping the slats in their edgewise position, a keyboard consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons and the slats and including actuating means for the latter.

18. In an apparatus of the class described, the combination of a score board comprising a plurality of casings, each having an aperture at the front and a plain background in rear of the aperture, a series of designations adjacent to the apertures to indicate "Balls", "Strikes", "Outs", etc., said apertures being of the conventional shape employed in base ball scoring, a series of slats arranged within each of the casings in rear of the aperture between the same and the background and movable in unison to arrange them edgewise to expose the background and flatwise to form a signal, means for stopping the slats in their edgewise po-

sition, a keyboard consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons and the slats including actuating means for the latter.

19. An apparatus of the class described comprising winding elements, a flexible strip provided with characters and connected with the winding elements and having a tension loop, a tension member engaging the loop and maintaining the flexible connection taut between the winding elements, spaced gear elements mounted in relatively fixed positions, one of the said elements being motor driven, means for communicating motion from the other gear element to the winding rolls, a relatively movable gear element adapted to be carried into and out of engagement with the said gear elements for communicating motion from the motor driven element to the winding elements, an electric circuit including an electro-magnet having an armature connected with the relatively movable gear element, and a switch arranged in the said circuit and operated by the tension member to break the circuit.

20. An apparatus of the class described comprising winding elements, a flexible strip provided with characters and connected with the winding elements and having a tension loop, a tension member engaging the loop and maintaining the flexible connection taut between the winding elements, spaced gear elements mounted in relatively fixed positions, one of the said elements being motor driven, means for communicating motion from the other gear element to the winding rolls, a relatively movable gear element adapted to be carried into and out of engagement with the said gear elements for communicating motion from the motor driven element to the winding elements, an electric circuit including an electro-magnet having an armature connected with the relatively movable gear element, a switch arranged in the said circuit and operated by the tension member to break the circuit, and yieldable means carrying the relatively movable gear element away from the spaced gear elements when the circuit is broken.

21. An apparatus of the class described comprising winding elements, a flexible strip connected with the winding elements and having a tension loop, gearing for operating the winding elements having a gear element movable into and out of engagement with the other elements of the gearing to start and stop the winding elements, a circuit including an electro-magnet connected with the said movable gear element for carrying the same to and from its engaging position, a tension device carried by the tension loop, a switch arranged in the said circuit, and means connected with the switch and arranged in the path of the tension device and

adapted to be actuated by the same to break the circuit.

22. An apparatus of the class described comprising winding elements, a flexible strip 5 connected with the winding elements and having a tension loop, gearing for operating the winding elements having a gear element movable into and out of engagement with the other elements of the gearing to start 10 and stop the winding elements, a circuit including an electro-magnet connected with the said movable gear element for carrying the same to and from its engaging position, a tension device carried by the tension loop, 15 a switch arranged in the said circuit, means connected with the switch and arranged in the path of the tension device and adapted to be actuated by the same to break the circuit, a lever arranged in the path of the tension device and adapted to be actuated by 20 the same, and a second lever connected with the switch and with the first-mentioned lever.

23. An apparatus of the class described 25 comprising a casing having an aperture, winding elements, a flexible strip connected with the winding elements and having a tension loop, a tension member engaging the loop to maintain the flexible connection taut 30 between the winding elements, gearing for communicating motion to the winding elements, one of the members of the gearing being movable into and out of mesh, an electric circuit including an electro-magnet 35 having an armature connected with the said member of the gearing, a spring for normally urging the said member to its inoperative position, a switch arranged in the circuit, a lever located in the path of the tension member and adapted to be actuated by 40 the same, and means for connecting the said lever with the switch for breaking the circuit.

24. An apparatus of the class described 45 comprising a flexible strip, a winding element, an electric motor, a gear element connected with and actuated by the said motor, gearing for communicating motion from the said gear element to the winding element 50 having a relatively movable member, means for normally urging the relatively movable member to an inoperative position in spaced relation with the gearing and the gear element, and an electric circuit including an 55 electro-magnet having an armature connected with the relatively movable gear member for carrying the same to its operative position.

25. An apparatus of the class described 60 comprising a casing having an aperture, upper and lower winding rolls, spaced guiding means arranged at the top and bottom of the aperture of the casing, a flexible binding strip extending across the space between 65 the said guiding means and connected with

the winding rolls and provided with a tension loop, upper and lower gears connected with the winding rolls, an intermediate gear meshing with the said gears, a friction roll 70 having a pinion meshing with the intermediate gear, a motor driven roll spaced from the friction roll, a relatively movable roll adapted to be carried into and out of engagement with the said friction rolls, a tension member supported by the tension loop, 75 a circuit including an electro-magnet having an armature connected with the relatively movable friction roll for carrying the same into engagement with the other friction rolls, a switch arranged in the said circuit, and means connected with the switch 80 and located in the path of the tension member and adapted to be actuated by the latter to break the circuit.

26. An apparatus of the class described 85 comprising a score board having a series of apertures and a series of designations for such apertures to indicate "Runs," "Score by innings," etc., a strip arranged in rear of each aperture and bearing numerals adapted 90 to be exposed at the apertures, means for moving the strip, a continuously rotating shaft, means for connecting the shaft with and disconnecting it from any one of the means for moving the strip, a key board 95 consisting of a miniature of the score board and having push buttons, and electrical connections between the push buttons and the connecting and disconnecting means.

27. An apparatus of the class described 100 comprising a score board having a series of apertures and a series of designations for such apertures to indicate "Runs," "Score by innings," etc., a strip arranged in rear of each of the apertures and bearing numbers 105 adapted to be exposed at the apertures, means for moving the strip, a continuously rotating shaft, a single motor for operating the continuously rotating shaft, means for 110 connecting the shaft with and disconnecting it from any one of the means for moving the strip, a key board consisting of a miniature of the score board and having push buttons, and electrical connections between 115 the push buttons and the connecting and disconnecting means.

28. An apparatus of the class described comprising a score board having a series of apertures and a series of designations for such apertures to indicate "Runs," "Score 120 by innings," etc., a flexible strip arranged in rear of each aperture and bearing numerals adapted to be exposed at the apertures, means for actuating the strip, a single 125 motor for all of the strip actuating means, means for connecting the motor with and disconnecting it from any one of the strip actuating means, a key board consisting of a miniature of the score board and having 130 push buttons, and electrical connections be-

tween the push buttons and the connecting and disconnecting means.

29. An apparatus of the class described including a plurality of signals, each consisting of a flexible strip provided with characters, winding elements having the terminal portions of the strip attached to them, said flexible strip being provided with a tension loop, yieldable means engaging the tension loop to maintain the strip taut between the winding elements, and means operated by the said yieldable means for automatically throwing a signal out of operation without affecting the other signals.

30. An apparatus of the class described including a score board provided with a group of character signals for indicating "Balls," "Strikes," "Outs" and the number of a player, and numeral signals for indicating "Runs" and the "Score by in-

nings," each number signal including a flexible strip having a tension loop, means for engaging the tension loop for maintaining the strip taut, a key board consisting of a miniature of the score board and having push buttons corresponding with the signals, electrical connections between the push buttons of the key board and the signals of the score board, and means arranged to be engaged by the tension loop engaging means for automatically cutting out a number signal without affecting the other signals.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

SAMUEL ARTHUR REDDING.

Witnesses:

EDMUND W. MARTIN,
S. W. HOWARD.