

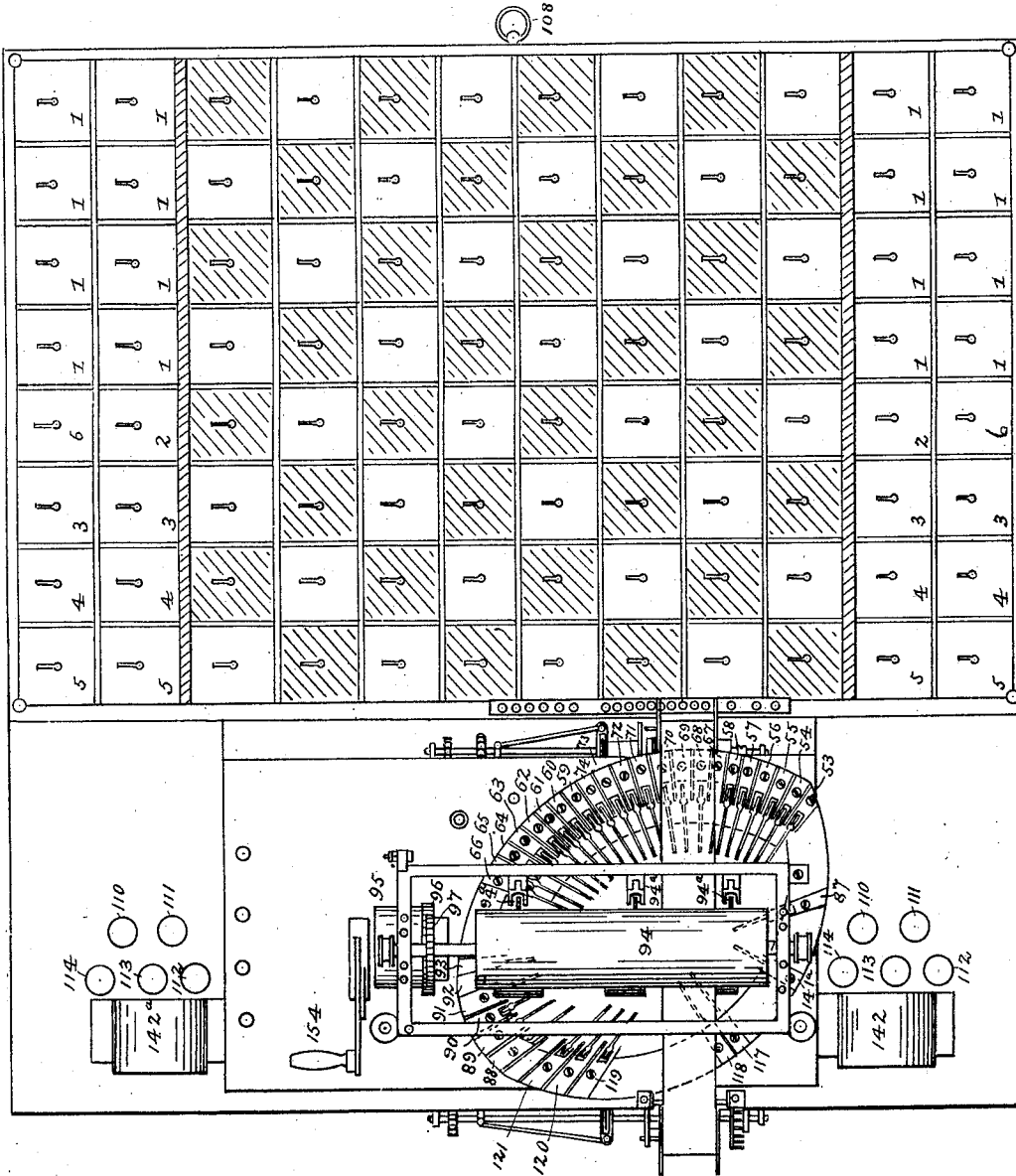
No. 810,899.

PATENTED JAN. 30, 1906.

L. R. BABU.  
CHESS RECORDER.  
APPLICATION FILED JULY 14, 1903.

7 SHEETS—SHEET 1.

Fig. 1.



Inventor:

Sala Raja Babu

Witnesses:

E. B. Bolton  
W. M. Kuehn

By Richard J. [Signature]

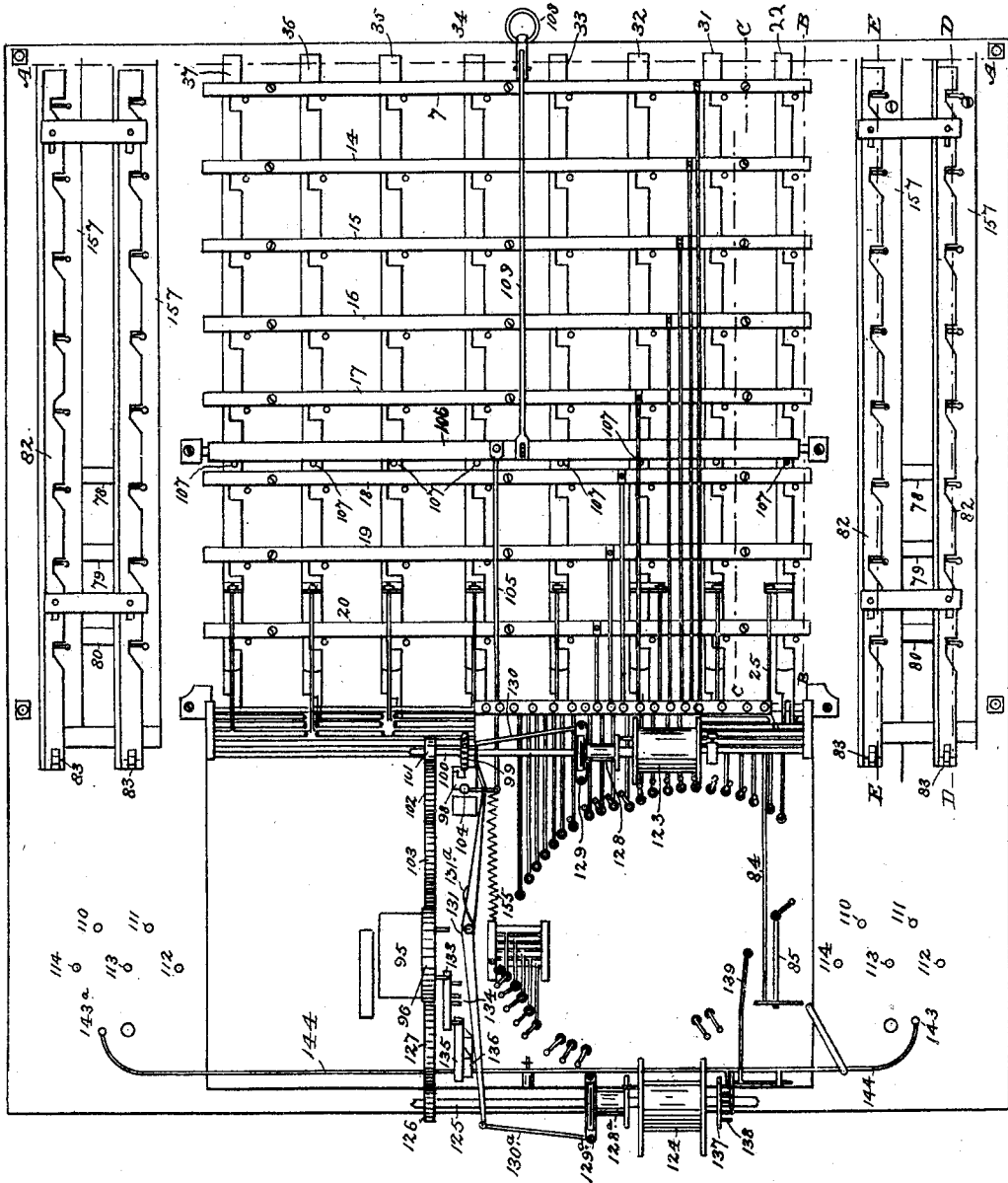
his Attorneys.

L. R. BABU.  
CHESS RECORDER.

APPLICATION FILED JULY 14, 1903.

7 SHEETS—SHEET 2.

Fig. 2.



Witnesses:

*E. R. Bolton*  
*Wm. Kuehne*

Inventor:  
*Sala Raja Babu*

*Richardson*

*his attorneys*

No. 810,899.

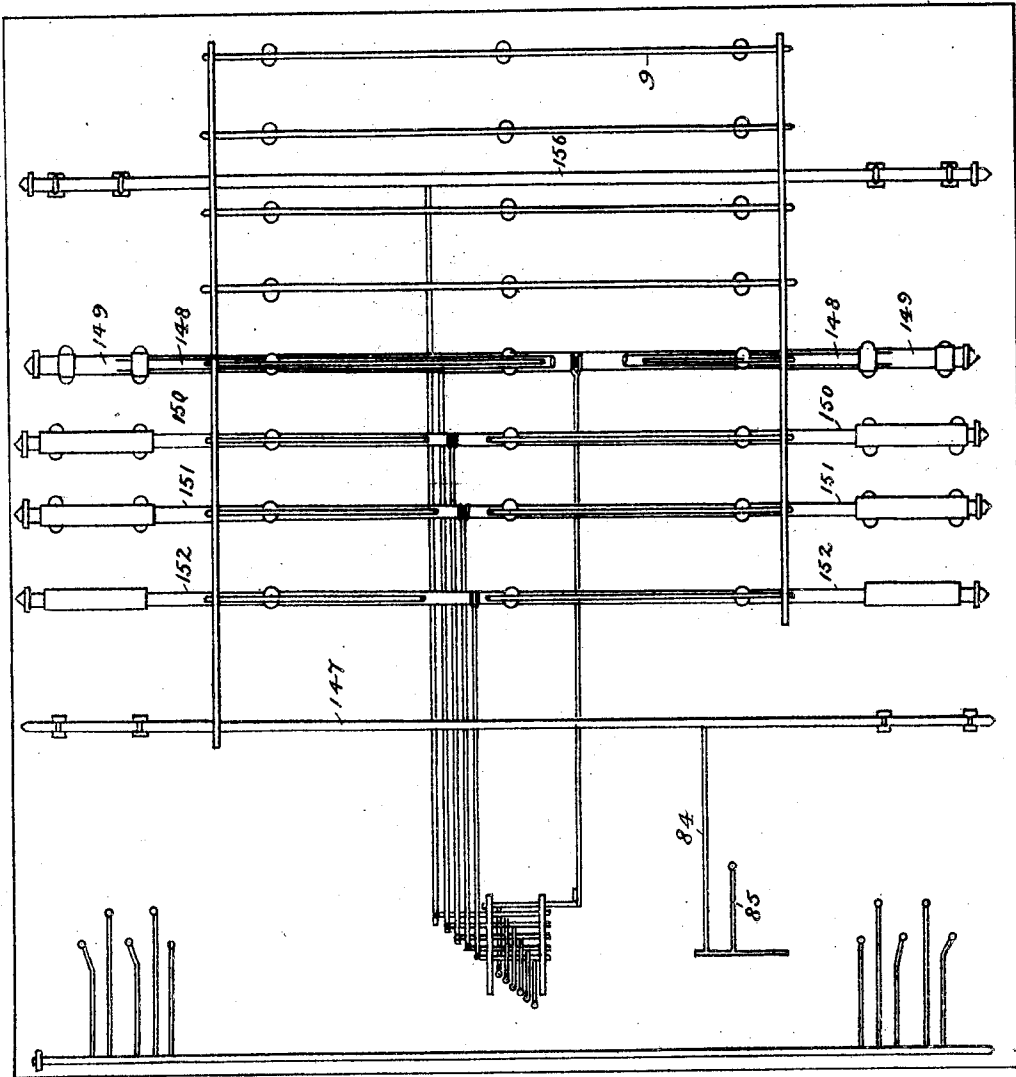
PATENTED JAN. 30, 1906.

L. R. BABU.  
CHESS RECORDER.

APPLICATION FILED JULY 14, 1903.

7 SHEETS—SHEET 3.

Fig. 3.



Witnesses:

E. B. Bolton  
Wm. Kuehne

Inventor:  
Lala Raja Babu

BY *[Signature]*  
his Attorneys.

No. 810,899.

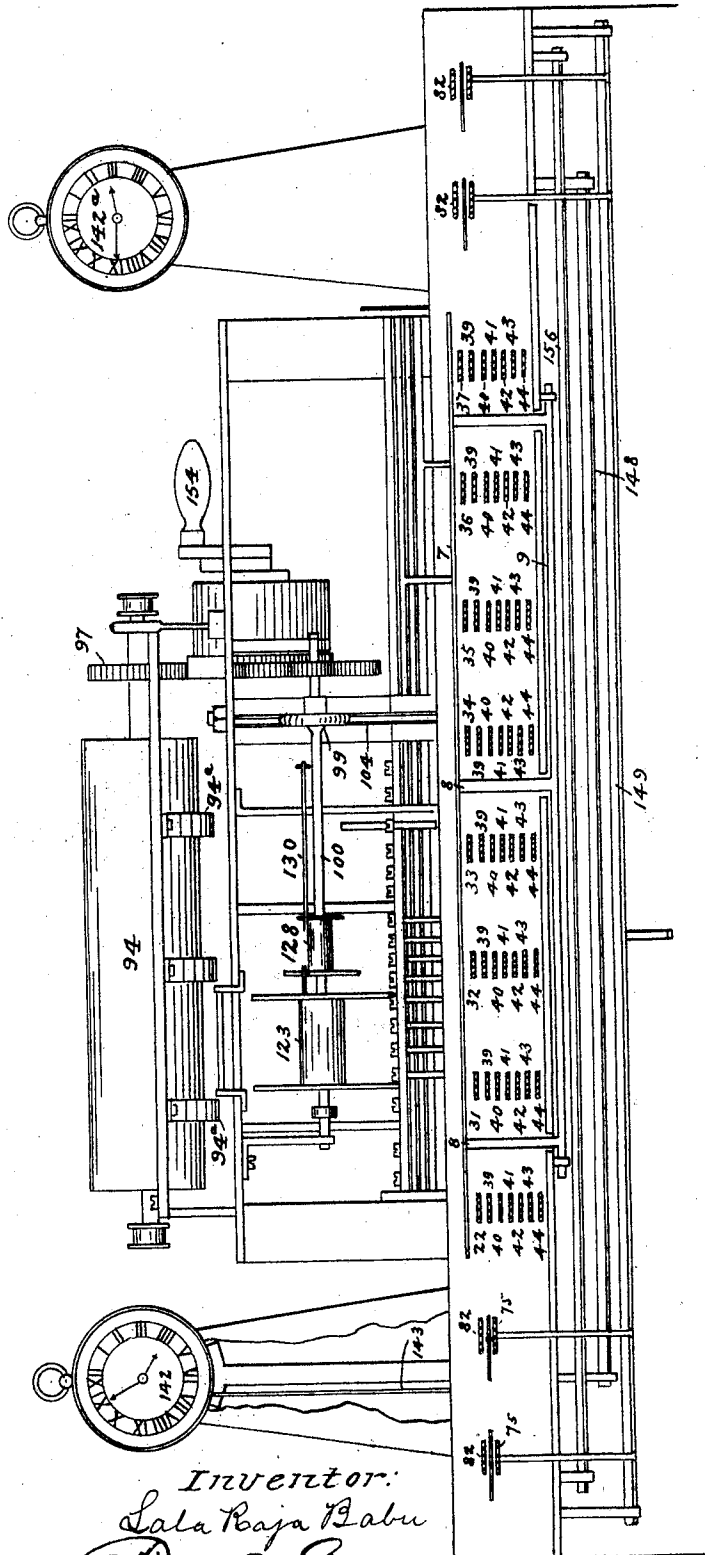
PATENTED JAN. 30, 1906.

L. R. BABU.  
CHESS RECORDER.

APPLICATION FILED JULY 14, 1903.

7 SHEETS—SHEET 4.

Fig. 4.



Witnesses:  
E. R. Bolton  
W. M. Kishner

Inventor:  
Sala Raja Babu  
By *[Signature]* his Attorneys

L. R. BABU.  
CHESS RECORDER.

APPLICATION FILED JULY 14, 1903.

7 SHEETS—SHEET 5.

Fig. 5.

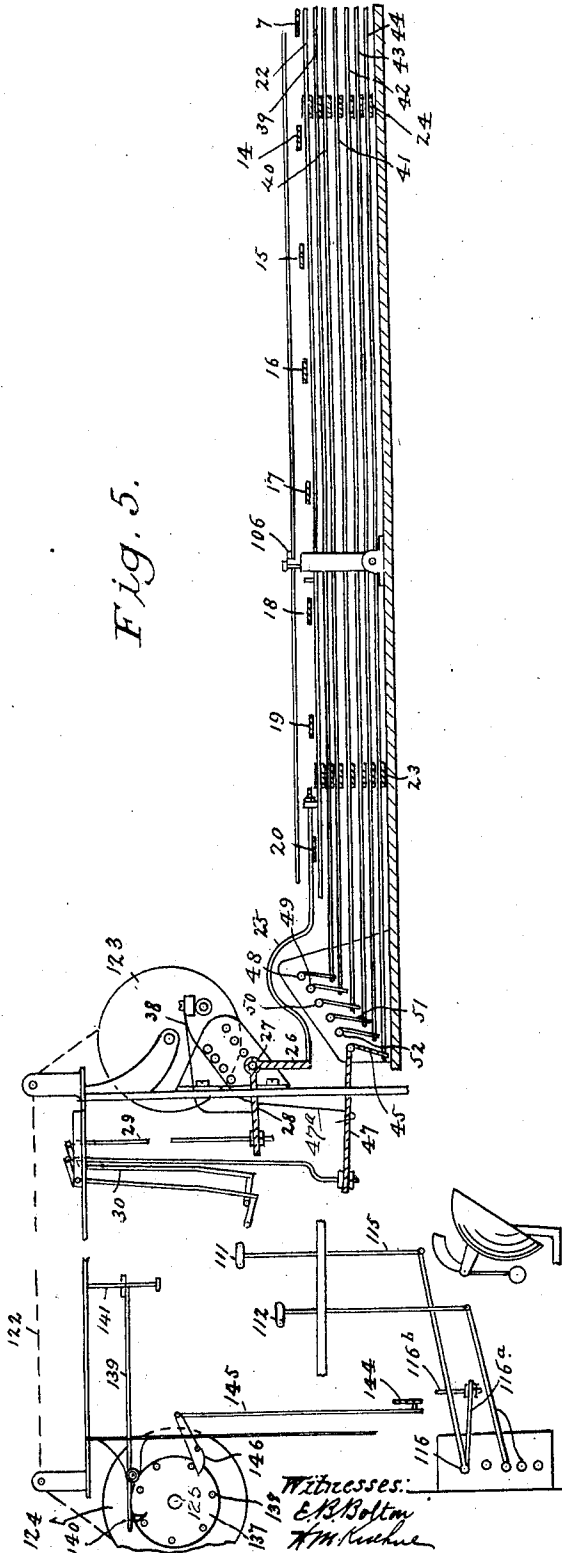
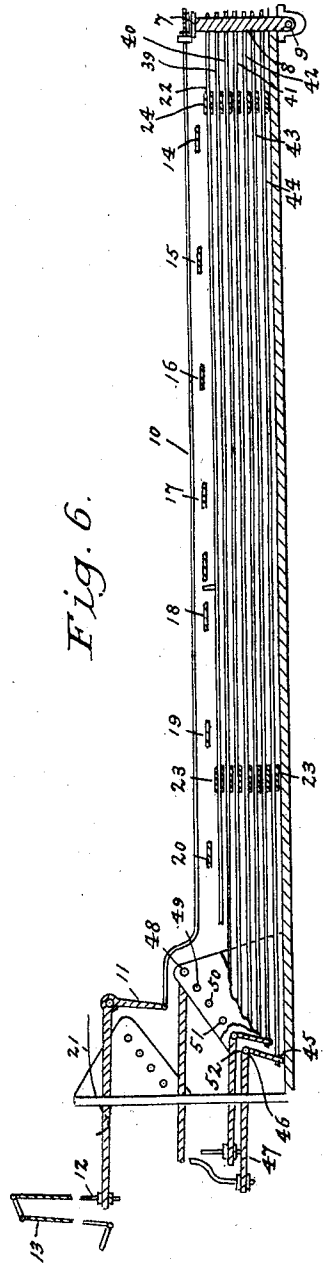


Fig. 6.



Inventor:  
Lala Raja Babu

*Ruhard*  
his Attorneys

Witnesses:  
E. R. Holtin  
W. M. Kuehn

No. 810,899.

PATENTED JAN. 30, 1906.

L. R. BABU.  
CHESS RECORDER.

APPLICATION FILED JULY 14, 1903.

7 SHEETS—SHEET 6.

Fig. 9.

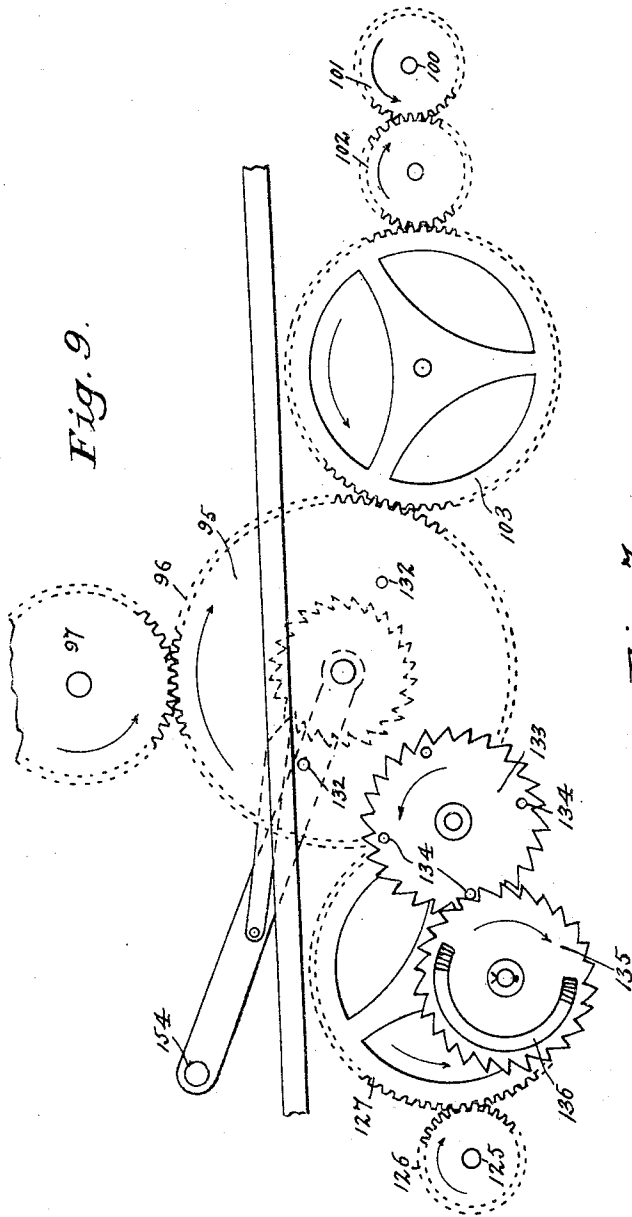
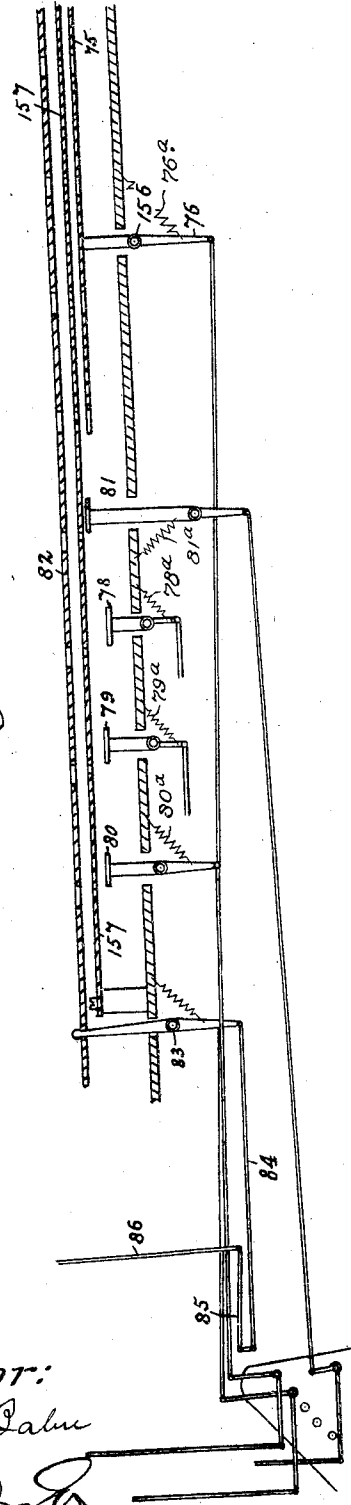


Fig. 7.



Witnesses:  
E. B. Bolton  
H. M. Kuehne

Inventor:  
Lala Raja Babu

By *[Signature]*  
his Attorneys.

L. R. BABU.  
CHESS RECORDER.

APPLICATION FILED JULY 14, 1903.

7 SHEETS—SHEET 7.

Fig. 8.

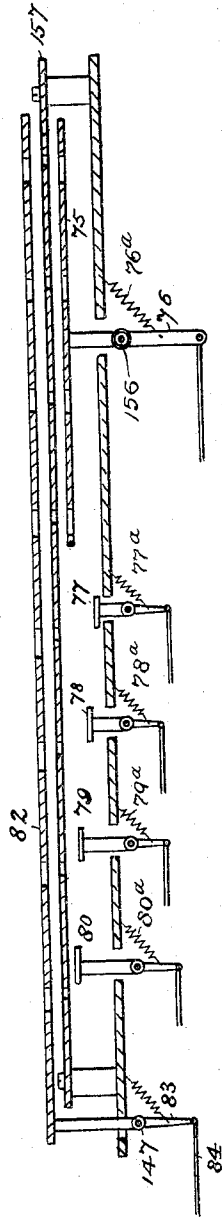


Fig. 10.

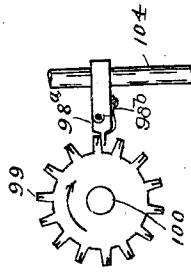


Fig. 11.

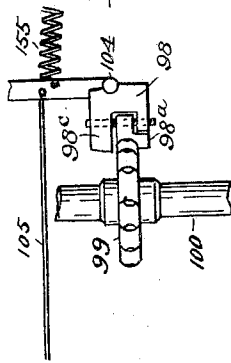


Fig. 12.



Fig. 13.

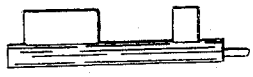


Fig. 14.



Fig. 15.



Fig. 16.



Fig. 17.



Witnesses:  
E. B. Bolton  
H. M. Kuehne

Inventor:  
Lala Raja Babu

By *Richardson*  
his Attorneys

# UNITED STATES PATENT OFFICE.

LALA RAJA BABU, OF PATIALA, PATIALA STATE, INDIA.

## CHESS-RECORDER.

No. 810,899.

Specification of Letters Patent.

Patented Jan. 30, 1906.

Application filed July 14, 1903. Serial No. 165,504.

*To all whom it may concern:*

Be it known that I, LALA RAJA BABU, a subject of His Highness the Maharaja of Patiala State, residing at Patiala, Patiala State, India, have invented a Chess-Recorder, of which the following is a full, clear, and exact specification.

The object of this invention is to provide a contrivance whereby the moves made during a game at chess are automatically recorded and the time taken by the parties precisely kept, thereby doing away with the necessity of a referee or the assistance of a third party to write down the moves as they are made, as well as obviating the chance of mistake.

According to this invention each chessman is provided with a key projecting from its base, each class of piece having a special kind of ward differing from the wards of the keys attached to chessmen of any other class. In each square of the chess-board is a keyhole which will fit the key of any piece. When a move is made, the piece moved is placed so that its key passes into the keyhole on the square to which it is moved. A sharp half-turn is given to the piece, and its key operates certain levers, which in their turn actuate certain type-bars, causing the move made to be printed on a piece of paper held against a roller somewhat in the manner of an ordinary type-writer. Each move thus made will cause a record of the piece moved and the square to which it is moved to be printed. Thus if a knight were moved to the fifth square in front of the white queen the record would read "Kt Q5." If a pawn had been moved to the same square, the record would be "P Q5," and so on. When a piece has been taken, it is placed in a square at the end of the board and given a similar half-turn, when a record will be made of the taking of that piece. Thus if a bishop were taken by a knight moving to the fourth square in front of the white king the printed record would show "Kt K4 × B." Similarly, the various movements of the men are recorded, the paper moving up after each move has been registered.

In order to more conveniently describe my invention, I propose to refer to the accompanying drawings, in which similar figures of reference designate like parts throughout, and in which—

Figure 1 is a general plan of the complete chess-board and recording mechanism. Fig. 2 is a general plan of same with the top of the chess-board, roller, type-bars, and plat-

form of recording mechanism removed. Fig. 3 is a similar view showing arrangement of the lower levers, &c. Fig. 4 is a front elevation, partly in section, through line A A of Fig. 2. Fig. 5 is a vertical section through line B B of Fig. 2. Fig. 6 is a vertical section through line C C of Fig. 2. Fig. 7 is a vertical section through line D D of Fig. 2. Fig. 8 is a vertical section through line E E of Fig. 2. Fig. 9 is an enlarged side elevation of the arrangement of toothed wheels actuating the roller and ribbon-change mechanism. Figs. 10 and 11 are enlarged side view and plan of dog mechanism for releasing the roller. Figs. 12, 13, 14, 15, 16, and 17 are enlarged views showing the wards on the keys attached to the king, queen, bishop, knight, castle, and pawn, respectively.

The chess-board is made in the usual form, save that in the center of each square is a keyhole to fit any of the keys attached to the bases of the pieces. At each end of the board are provided sixteen additional squares with similar keyholes into which are placed pieces as they are captured, the squares 1 being reserved for pawns, 2 for the queen, 3 for the bishops, 4 for the knights, 5 for the castles, and 6 for any pawn converted into a queen. Beneath the chess-board are a series of bars the operation of which by the wards of the keys on the pieces causes the moves to be registered.

7, Fig. 6, is a horizontal cross-bar which is attached to three short vertical cranks 8, fixed to a pivoted rod 9. To the top of the bar 7 is fixed a rod 10, connected to a bell-crank lever 11, which is in turn attached to a rod 12, the other end of the latter being connected to a bell-crank lever 13, on whose other end is attached the type-head which prints "R" to represent the line of the king's castle. Similarly, the horizontal cross-bars 14, 15, 16, 17, 18, 19, and 20 operate the types recording "Kt," "B," "K," "Q," "B," "Kt," and "R" to represent the lines of the king's knight, king's bishop, king, queen, queen's bishop, queen's knight, and queen's castle, respectively. Small springs 21 are so arranged as to cause these bars to return to their former position after each movement.

22, Fig. 5, is a horizontal bar capable of sliding longitudinally between plates 23 and 24. This bar is attached to a curved rod 25, which in turn is connected to a crank 26 on a pivoted rod 27. Another crank 28 on this

rod 27 is attached to the bar 29, connecting with the crank-lever 30, carrying the type to indicate "1." The actuating of the bar 22 is intended to record the number of the row of the square in which the piece has been placed. Similarly, the horizontal bars 31, 32, 33, 34, 35, 36, and 37, Fig. 2, actuate types to record "2," "3," "4," "5," "6," "7," and "8," though for the purpose of simplification the connections of these bars are not shown. It will readily be seen that it is not necessary that the pivoted rod 27 should be inserted in the mechanism necessary to make the horizontal bar 22 operate its type-head or similar pivoted rods to make the horizontal bars 31, 32, 33, 34, 35, 36, and 37 operate their respective type-heads; but I have found it convenient to do so in order to properly arrange the various type-bars in their basket. A spring 38 is attached to the mechanism of each of these horizontal bars to cause them to return to their normal position after each movement.

Directly below each of the horizontal bars 22, 31, 32, 33, 34, 35, 36, and 37 are a series of six somewhat similar bars 39, 40, 41, 42, 43, and 44, capable of longitudinal movement between the plates 23 and 24. The uppermost of these bars 39 is operated by the key on the pawn, the second bar 40 is operated by the key on the castle, and similarly the bars 41, 42, 43, and 44 are operated by the keys on the knight, bishop, queen, and king, respectively. One end of the bar 44 is attached to a crank 45 and pivoted rod 46, (to which all the bars 44 are similarly connected.) On this pivoted rod is an arm 47, attached to a bell-crank lever, on the other end of which is the type-head to print "K" to represent the king. A spring 47<sup>a</sup> exerts an upward force on the arm 47 to return the bar 44 to its normal position after each movement. Similarly, the bars 39, 40, 41, 42, and 43 are connected to pivoted rods 48, 49, 50, 51, and 52, respectively. These pivoted rods run the length of the board, and to each rod is attached the eight bars which are intended to operate the same type. Thus the eight bars 43, which are actuated by the queen's key, are connected to the same pivoted rod—viz., 52. Springs similar to 47<sup>a</sup> actuate the bars 39 to 43 to cause them to return to their normal positions after each movement. These springs are not shown for the sake of clearness in the drawings.

On reference to Figs. 12 to 17 it will be seen that the key on each piece is provided with a broad upper ward to actuate both the cross horizontal rod (which operates the type marking the line in which the square to which a piece is moved occurs) and the top horizontal bar (which operates the type indicating the number of the row of the square) and with a narrower lower ward to operate the particular bar which actuates the type indicating the name of the piece to which the key is attached.

The type are so arranged in the basket that the three type-heads (the first to indicate the kind of piece moved, the second the file in which the square to which the piece is moved occurs, and the third the number of the row of that square) strike the paper on which the impressions are being made without interfering with each other and so that the three may strike together in their correct places. Thus if the castle be moved to the third square in front of the queen's bishop the bars operated will cause the following to print "R B3." The arrangement of the type in the type-basket need not, however, be exactly as shown in Fig. 1, though that arrangement is a convenient one. The type-heads 53, 54, 55, 56, 57, and 58 print the signs representing the king, queen, bishop, knight, castle, and pawn, respectively, and imprint on the left-hand side of the paper to indicate the nature of the piece moved. The type-heads 59, 60, 61, 62, 63, 64, 65, and 66 print the figures "1" to "8," respectively indicating the number of the row of the square to which the piece has been moved. The type-heads 67, 68, 69, 70, 71, 72, 73, and 74 print the signs representing the files of king's castle, king's knight, king's bishop, king, queen, queen's bishop, queen's knight, and queen's castle.

Beneath the additional sixteen squares placed at each end of the board and into which the pieces taken are placed is the mechanism whereby a record is made of any piece being placed therein. This mechanism is somewhat similar to that provided for registering the moves of the pieces on the board, but not so complicated by reason of the fact that each square does not require a series of six bars to register the nature of the piece inserted, but as each square is reserved for a special class of piece only one bar is sufficient for the purpose. Thus for the eight squares 1 reserved for the pawns there are two horizontal bars 75, Fig. 7, which are suitably connected and are attached to the lever 76, whose other end is connected, by means of a series of rods, cranks, and pivoting-bars, to the type-head indicating the pawn. A spiral or other spring 76<sup>a</sup>, Fig. 7, is attached to the lever 76, causing it to return to normal after each movement. For the other pieces short horizontal cross-bars are employed, 77 to be worked by the queen, 78 by the bishop, 79 by the knight, 80 by the castle, and 81 by the pawn converted into a queen. All these bars are suitably connected to the type-heads they are intended to operate, being returned to normal under the influence of springs 77<sup>a</sup>, 78<sup>a</sup>, 79<sup>a</sup>, 80<sup>a</sup>, and 81<sup>a</sup>, respectively. (See Figs. 7 and 8.) Above these bars and so arranged as to be operated by the key of any piece placed in any of the squares are two parallel connected horizontal bars 82, running longitudinally, which are connected to a lever 83, whose other end is attached to a rod 84, attached to the bell-crank

lever 85, actuating the rod 86, controlling the type-sign "×" to indicate "takes." Between the bars 82 and 75 is a fixed plate 157, bored with keyholes similar to the top of the chess-board, which guide the keys and enable them to operate their levers correctly.

The sign "×" is printed in front of the sign of the piece which has been taken. Thus a pawn on being taken and placed in one of the squares allotted for its reception and given a half-turn will cause a record to be printed as follows: "× P."

It will be seen that there are two sets of sixteen additional squares, (one set at each end of the board.) The bars operated by the same class of pieces are connected across—that is, the bars operated by the pawns at one end are connected by a rod 156, Fig. 3, to the bars operated by the pawns at the other end, and it is to this rod 156 that the mechanism for operating the type-bar is connected. Similarly, the bars at each end operated by the queen, pawn converted into a queen, bishop, knight, and castle are connected by bars 148, 149, 150, 151, and 152, respectively. The top bars to operate the sign "×" are also connected across by the bar 147. The springs 76<sup>a</sup>, 77<sup>a</sup>, 78<sup>a</sup>, 79<sup>a</sup>, 80<sup>a</sup>, and 81<sup>a</sup>, respectively, return these bars to normal after each movement.

The type-bar 87 prints the sign "×," while the type-bars 88, 89, 90, 91, 92, and 93 print the signs indicating the castle, knight, bishop, queen, and pawn, and the pawn converted into a queen, respectively.

The printing is performed upon a piece of paper placed around the roller 94, similar to rollers used in type-writers, with this difference, however, that the roller does not travel longitudinally, but merely rotates. The paper is kept in position by small rollers 94<sup>a</sup>, pressing against the roller 94. The roller rotates under the influence of a spring wound in the drum 95, which is geared to the roller through the medium of the cog-wheels 96 and 97. The rotation of the roller is, however, controlled by an arrangement of dogs 98, gearing with the toothed wheel 99 on spindle 100, which through the medium of the series of cog-wheels 101, 102, and 103 gears with the cog-wheel 96, attached to the spring-drum 95. The dogs are fixed to a pivoted rod 104, which is partially rotated by means of a bent arm-rod 105, attached to the cross-bar 106, actuated each time a piece is given a half-turn on any square of the board by means of the pins 107, placed on each of the bars 22, 31, 32, 33, 34, 35, 36, and 37. As the pivoted rod 104 is partially rotated it causes the loose jaw 98<sup>a</sup> of the dogs 98 to slip off the tooth of the toothed wheel 99 in engagement with it and to rise under the action of the springs 98<sup>b</sup> ready to meet the next tooth as the wheel 99 rotates and the fixed jaw 98<sup>c</sup> of the dogs to engage with the tooth released by the loose jaw 98<sup>a</sup>. During this movement the toothed wheel 99 will have

been prevented from rotating by the fixed jaw 98<sup>c</sup> of the dogs; but when the tension on the bar 105 is released the dogs return to their normal position under the action of the spring 155, causing the jaw 98<sup>c</sup> to disengage with the toothed wheel 99, which rotates under the action of the coiled spring in the drum 95 until its next tooth meets the loose jaw 98<sup>a</sup> and presses it into the position shown in Fig. 10. The bar 106 is also actuated by pulling the ring 108, attached to the bar 109, should it be desired at any time to rotate the roller without printing a move. Each time a move is made and recorded the dogs will move sufficiently to allow the toothed wheel 99 to rotate the distance of one tooth, thus releasing the drum sufficiently to cause it to rotate the roller one line up. A suitable spring 155 is placed to cause the dogs and the connecting-rods and levers to return to normal after each move.

It will be observed that the dogs are only actuated when a piece is placed in any square of the board itself, but are not affected by the placing of any piece in any of the additional squares at the ends of the board. When a piece, therefore, is taken, it should first be placed in its appointed square at one end of the board and given a half-turn, so that the fact of its being so taken is recorded, and then the actual move recorded in the manner indicated. If a pawn on the queen four be taken by a bishop, the pawn would be placed in one of the allotted squares, when the type would register "× P" and then the bishop placed on the square vacated by the pawn, when the type would further register the move and the whole record would read "B Q4 × P," and the roller would move up one line. Were the bishop first to be placed in position and then the pawn, the record of the taking of the pawn would be printed on the line immediately below the proper line.

At the side at each end are arranged a series of five button-headed keys 110, 111, 112, 113, and 114, the pressing of which cause signs indicating "check," "castles," "resigns," "draw," and "mate," respectively, to be recorded. The mechanisms whereby the printing of the key causes the desired sign to be printed is similar for all keys and only that of one need be described. The key 111, Fig. 5, for castles is attached to a vertical rod 115, which is connected to an arm on a pivoted rod 116, (the key for castles at the other side of the recorder being also connected to this rod 116.) On this rod 116 is another fixed arm 116<sup>a</sup>, whose end is attached to a rod 116<sup>b</sup>, attached to the crank-lever carrying the type. 117 is the type-bar to register the sign for check, while 118, 119, 120, and 121 register mate, castles, draw, and designs, respectively. All these keys and their connections return to normal under the influence of suitable springs. The type-heads are arranged to strike

through a ribbon 122 in the manner common to ribbon type-writers. The method in which this ribbon moves and the manner in which it is placed in reference to the roller are, however, different. The ribbon is placed so as to be and to travel at right angles to the axis of the roller and is wound on two drums 123 and 124, the drum 123 being loosely mounted on the spindle 100 and the drum 124 loosely mounted on spindle 125 of cog-wheel 126, which is rotated through the medium of the cog-wheel 127 by the cog-wheel 96 on spring-drum 95. On the spindles 100 and 125 are mounted double disks 128 and 128<sup>a</sup>, which revolve with their respective spindles, but are capable of longitudinal movement on their spindles. On one of each pair of these disks are certain projections arranged to engage with pins placed on the side of the ribbon-drums 123 and 124, while the other of each pair of disks revolves in slots in the pivoted arms 129 and 129<sup>a</sup>, which by means of rods 130 and 130<sup>a</sup>, respectively, are connected to a lever 131, so pivoted that one of the disks is in engagement with its drum while the other disk will be free from its drum. Thus while one drum revolves with its spindle and winds the ribbon on itself the other drum will be loose and admit of the ribbon on it being unwound. To change the direction in which the ribbon is being wound, an arrangement is shown in Fig. 9. On the drum 95 are attached one or two pins 132, which as they rotate engage with the tooth-wheel 133 and cause it to move the distance of one tooth each time a pin engages with it. On this tooth-wheel 133 are pins 134, which engage with the tooth-wheel 135, causing it to move the distance of one tooth each time one of the pins 134 engages with it. Projecting from the side of the tooth-wheel 135 is a semicircular wall 136, made to incline down to the level of the tooth-wheel 135 at one end. This wall 136 during a portion of its revolution presses against the lever 131 and causes the lever to assume the position in which the disk 128<sup>a</sup> engages with the ribbon-drum 124. When the wall has so far moved that its end gets beyond the lever, such lever under the influence of a spring 131<sup>a</sup> moves so that the disk 128<sup>a</sup> falls out of engagement with the ribbon-drum 124, while the other disk and drum come into engagement, causing that drum to revolve with its spindle and so change the direction of the winding of the ribbon. As the wall 136 further revolves its inclined end comes into contact with the lever 131 and causes it gradually to assume the first-described position, when the direction of the winding of the ribbon is again changed. By adjusting the number of teeth on the wheels 133 and 135 and the number of pins 132 and 134 the direction of the travel of the ribbon can be arranged to change at the proper time, having regard to its length.

As after each move is recorded the roller, with the paper on which the record is being printed, is automatically moved up one line, it follows that the whole series of moves alternately made by each side appear in one long column. In order to facilitate the reading of the moves so recorded, they are divided off into couples by means of a line which is automatically printed after the move of one side. This is accomplished in the following manner: On the spindle 125 is a disk 137, Fig. 5, on which are seven pins 138. A lever 139, with a curved tooth 140 on one arm, is so pivoted that as the drum rotates the pins will strike against the said tooth and cause the lever-arm to which it is attached to be jerked up. On the other end of the lever is a slot through which a rod 141 passes, having a stop-nut toward its lower end and its upper end being attached to the crank-lever 141<sup>a</sup>, carrying the type-head to print a straight line. As the toothed end of the lever 139 is knocked up by one of the pins it causes the other end to give a sudden jerk to the rod 141, thereby making the type-head impinge on the paper through the ribbon. The actuating-spindle of the ribbon-drums 123 and 124 being driven through the cog-wheels 101 and 126, respectively, each of which are set in motion by the releasing of the toothed wheel 99, which is provided with fourteen teeth, the pins 138 will only come into position to strike the tooth 140 at every other move of the roller and ribbon. The line will therefore be printed so as to separate the record of moves into groups of two.

As a limit of time is placed on a player's moves, (being generally fifteen moves to the hour,) I have devised an arrangement whereby the time occupied by each player in making his moves is recorded. This is accomplished by two clocks 142 and 142<sup>a</sup>, one for each player, which are so arranged that only one clock (that of the player whose turn it is to play) works at a time, the other clock being stopped by a brake attached to the rod 143, engaging with some convenient portion of the works of the clock to be stopped. The rods 143 and 143<sup>a</sup> (one for each clock) are attached to opposite ends of the lever 144, so pivoted that when either rod is in engagement and is stopping its clock the other rod disengages and allows its clock to work. The position of the lever is controlled by a rod 145, attached to one end of a trip 146, whose other end is in a position to engage with the pins 138. When one of the pins 138 engages with said trip 146, the end of the latter is forced down, making one end of the lever 144 rise sufficiently to cause the brake to be released from the clock at one end and to be put on the clock at the other end. A spring is so arranged to cause the lever 144 to assume its former position as soon as the trip 146 is released from engagement with the pin 138. As these pins are

seven in number compared with the fourteen teeth of the toothed wheel 99, which actuates the disk 137, a pin 138 will only engage the trip 146 every other move, said trip being released during the intermediate moves. The clocks will therefore work alternately. As soon as a player makes a move and records it in the manner above indicated the carriage moves up one line, the ribbon mechanism moves one space, and the clock recording the time of that player stops and the other clock starts.

A ratchet-handle 154 is provided for winding up the spring-drum when it runs down.

It must be understood that the drawings illustrate one of the many forms my invention may take, and it will be seen that the arrangement of the various parts and their connections can be altered in many ways without departing from my invention.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In an apparatus for recording the moves at a game of chess, the combination of a game-board having a keyhole in the center of each square, a key on the base of each piece adapted to fit into any of said keyholes, type corresponding with the name of the piece moved, actuated by the partial rotation of the key on the piece so moved, a lug or ward on the key, a series of six horizontal bars placed under each of the eight cross-lines of squares actuated by said lug or ward when the key is rotated, a bell-crank lever connected to the uppermost bars, a type-head connected on the other end of said lever, a recording-platen on which the type-head is adapted to print a sign representing the name of one piece, a type-bar actuated in like manner from the second bars in all the series, said type-bar carrying a sign to represent the name of another piece, and similarly with the remaining bars of all the series, said lug or ward on the key being so placed that when such key is inserted in a keyhole and rotated it actuates the bar in the series connected to the type-bar intended to print the name of the piece to which such key is attached.

2. In an apparatus for recording the moves at a game of chess, the combination of a game-board having a keyhole in the center of each square, a key on the base of each piece adapted to fit into any of said keyholes, type actuated by said key, said type indicating the file of the square to which the piece carrying the key is moved, a lug or ward on said key, eight horizontal longitudinal bars, one placed under each of the eight longitudinal lines of squares, one of said bars being adapted to be actuated by said lug or ward of said key, a bell-crank lever connected to the bar under the extreme line of squares on the right side, a type-head carrying the sign representing the file of the

king's castle connected to the other end of said bell-crank lever, a type-head carrying the sign representing the file of the king's knight actuated by the next bar, and so on, the position of all such lugs or wards on the keys being similar so that when a key is rotated it actuates the bar in the file of squares in which it is placed to cause the sign of that file to be printed.

3. In an apparatus for recording the moves at a game of chess, the combination of a game-board having a keyhole in the center of each square, a key on the base of each piece adapted to fit into any of said keyholes, type recording the number of the row of squares to which a piece is moved actuated by the key of said piece, a lug or ward on the key, eight horizontal cross-bars, one placed under each of the eight cross-rows of squares, one of which bars being actuated by the partial rotation of the key, a bell-crank lever connected to the bar under the back row of the white side of the board, said lever carrying type to print the sign "1" to represent the number of each square in that row, the next bar being in like manner arranged to actuate the type printing the sign "2" and similarly the other bars, the last being connected to actuate the type-bar printing the sign "8," the position of all such lugs or wards on the keys being similar so that when a key is inserted in a keyhole and rotated it actuates the bar in the cross-row in which it is placed and through it causes the sign of that row to be printed.

4. In an apparatus for recording the moves at a game of chess, the combination of a game-board having a keyhole in the center of each square, a key on the base of each piece adapted to fit into any of said keyholes and be capable of partial rotation, type actuated by the rotation of said key, two lugs or wards on said key, a series of six horizontal bars placed under each of the eight cross-lines of squares, one of which bars being actuated by the first of said lugs, the position of said lug varying according to the name of the piece, a bell-crank lever connected to the uppermost bars in all the series, a type-bar adapted to print a sign representing the name of one piece mounted on said bell-crank lever, a recording-platen for said type-bar, a type-bar connected to and actuated by, in like manner, the second bars in all the series, said type-bar carrying a sign to represent the name of another piece, and similar with the remaining bars of all the series, type indicating the file of the square to which the piece is moved, said type being actuated by the upper portion of said second lug, the position of said second lug being the same for any piece, eight horizontal longitudinal bars, one placed under each of the eight longitudinal lines of squares, one of which bars being actuated by the partial rotation of said key, a bell-crank lever connected to the bar under the extreme

line of squares on the right side, a type-head attached to the other end of said bell-crank, said type-head printing the sign representing the file of the king's castle, the actuation of the next bar printing the sign of the king's knight and so on, type actuated by the lower portion of said second lug on said key, the position of which being the same for any piece, said type recording the number of the row of squares to which a piece is moved, eight horizontal cross-bars, one placed under each of the eight rows of squares, one of said bars being actuated by the partial rotation of said key, a bell-crank lever connected to the bar under the back row of the white side, type connected to said lever to print the sign "1" to represent the number of each square in that row, the next bar being in like manner arranged to actuate the type carrying the sign "2" and similarly the other bars, the last bar being connected to actuate the type-bar carrying the sign "8," all three type-bars actuated by the rotation of a piece making their record together.

5. In an apparatus for recording the moves at a game of chess, sixteen additional squares at each end of the board having keyholes therein for the reception of the taken pieces, a type-bar carrying the sign "X" to represent the taking of a piece, means for actuating said type-bar, and means for printing the name of the piece taken consisting of horizontal bars placed below said keyholes, type-bars carrying the signs representing the pieces, queen, bishop, knight, castle, pawn and pawn converted into a queen, said type-bars being connected to the horizontal bars, special squares for each class of piece and the record being made by the insertion of the key on the base of a piece and the partial rotation of the same.

6. In combination in an apparatus of the class described, a game-board and pieces therefor, keys on the base of said pieces adapted to fit keyholes on the squares of said board and operate means for printing the name of the piece and the square to which it is moved by the partial rotation of the piece, a platen and means for operating the same consisting of clockwork mechanism controlled by an escapement-wheel, dogs engaging said escapement-wheel, said dogs being operated by the movement of the pieces, and means for operating the dog mechanism independently of the pieces, substantially as described.

7. In combination in an apparatus of the class described, a game-board and pieces therefor, keys on the base of said pieces adapted to fit keyholes in the squares of said board and operate means for printing the name of the piece and the square to which it is moved by the partial rotation of the piece, a clockwork mechanism rotating a platen, means for controlling the movement of said platen consisting of an escapement-wheel controlled by dogs, and means for printing a line below the record of every other move consisting of a spindle rotated by said clockwork mechanism, a disk on said spindle, pins mounted on said disk, the number of pins of said disk being exactly half that of the teeth of said escapement-wheel, a pivoted lever having a curved end capable of engagement with said pins which by the rotation of said spindle are caused to strike said curved end of the lever and cause its other end to actuate a crank-lever carrying a type-head to print a straight line.

8. An apparatus for recording the moves at a game of chess comprising a game-board having a keyhole in the center of each square, keys on the base of the pieces adapted to fit said keyholes and operate means for printing the name of the piece and the square to which it is moved by the partial rotation of the piece, a platen and means for operating the same consisting of clockwork mechanism controlled by an escapement-wheel, dogs engaging said escapement-wheel, said dogs being operated by the movement of the pieces, means for operating the dog mechanism independently of the movement of the pieces, sixteen additional squares at each end of the board, means for recording the taking of the pieces, means for printing a line below the record of every other move, additional means independent of the escapement mechanism for printing the signs to represent "check," "castles," "resigns," "draw" and "mate" respectively, and means for alternately starting and stopping two clocks to record the time taken by each player, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LALA RAJA BABU.

Witnesses:

RANG BIHARI DIL,  
OHOLÉ SHUNKER.