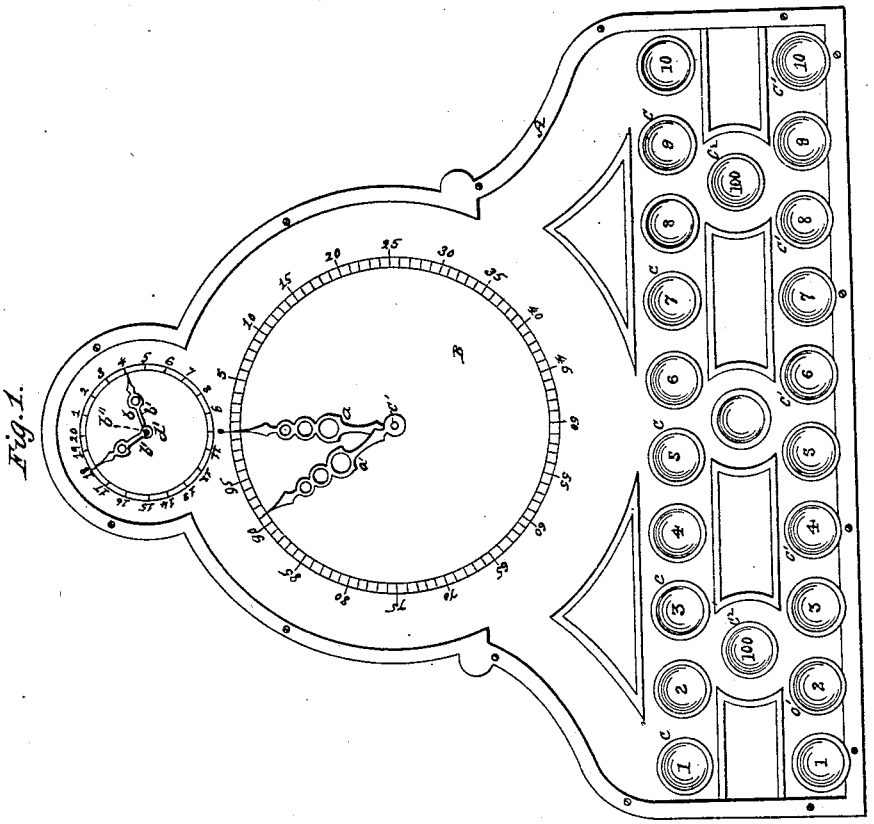
2 Sheets—Sheet 1.

# WIRSCHING & ZOEHE.

## Billiard Register.

No. 54,806. Patented May 15, 1866.

Fig. 1.



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2 Sheets—Sheet 2.

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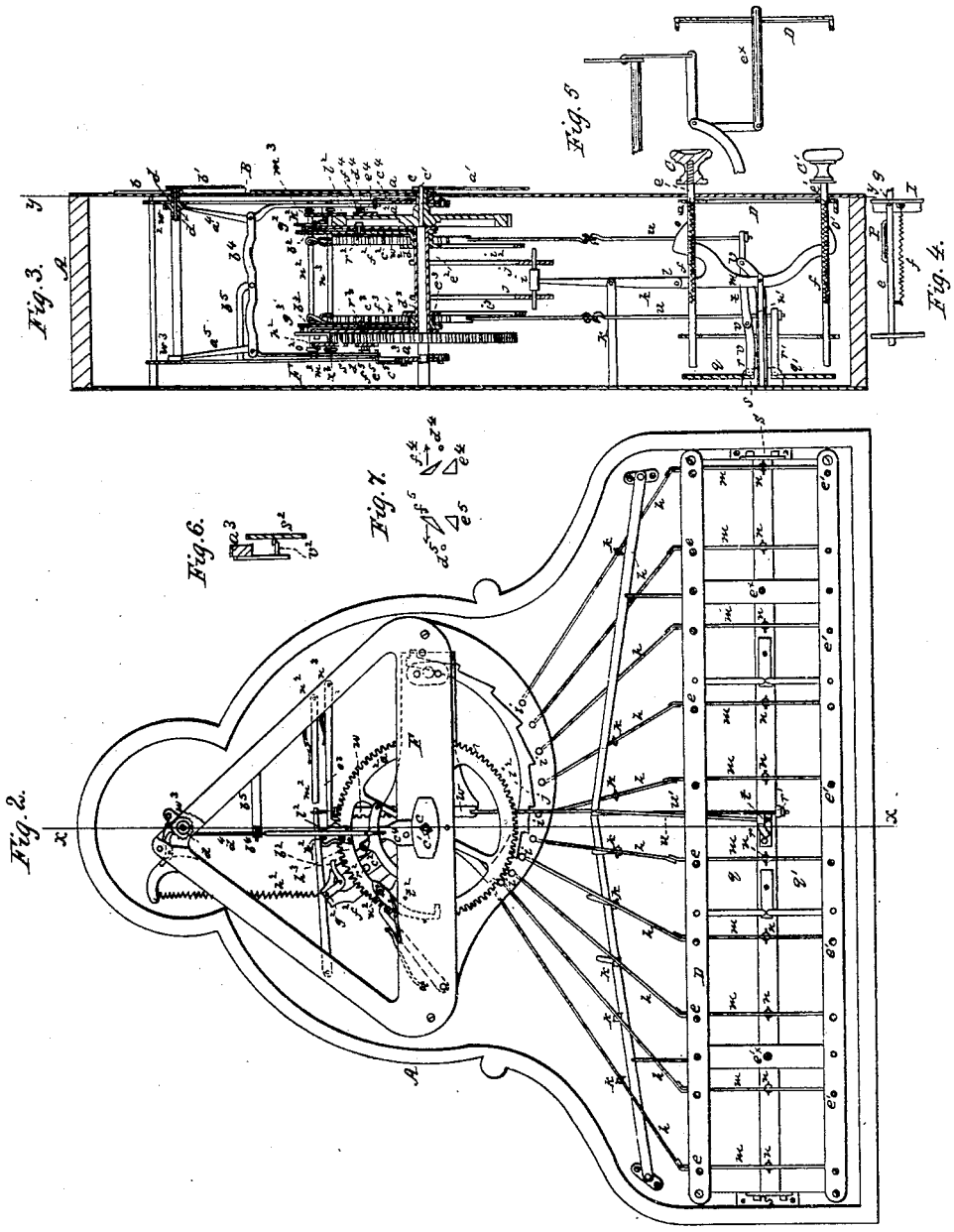


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# UNITED STATES PATENT OFFICE.

A. WIRSCHING AND WM. ZOEHE, OF WILLIAMSBURG, NEW YORK.

## BILLIARD-REGISTER.

Specification forming part of Letters Patent No. **54,806**, dated May 15, 1866.

*To all whom it may concern:*

Be it known that we, A. WIRSCHING and W. ZOEHE, of Williamsburg, in the county of Kings and State of New York, have invented a new and Improved Billiard-Indicator; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a front elevation of this invention. Fig. 2 is a longitudinal vertical section of the same, the line *y y*, Fig. 3, indicating the plane of section. Fig. 3 is a transverse vertical section of the same, the plane of section being indicated by the line *x x*, Fig. 2. Fig. 4 is a detached side elevation of one of the stickers which give motion to the indicating mechanism. Fig. 5 is a detached elevation of the lever arrangement acted upon by depressing the buttons marked 100.

Similar letters of reference indicate like parts.

This invention relates to a billiard-indicator in which two sets of buttons or keys are used, one set for each player. Said keys are secured to stickers, which act upon the mechanism by which the index-hands are turned the required distance, and they are concave on their faces to enable the players to depress them conveniently with their cues. The two sets of keys are made or colored in different colors—for instance, one set black and the other white—so that they can be readily distinguished, and each set consists of eleven keys, ten of which are marked with figures running from 1 to 10, whereas the eleventh key in each set is marked with the figure 100. The mechanism which transmits the motion of the keys to the index-hands is so arranged that by depressing one of the keys the index-hand belonging to said key is moved in accordance with the figure marked on said key, and if one player has completed one hundred points, or the number of points indicating that the game is up, causing his index-hand to return to the starting-point on the dial, the motion of the mechanism acting on his index-hand is arrested until the index-hand of the other player is also turned to the starting-point, and consequently the players are prevented from extending the game beyond the proper time. The number of games which each player wins or loses is indicated by additional index-hands, one of which is moved ahead one degree whenever the index-hand of one of the players passes the starting-point.

A represents a frame or box, made of wood or any other suitable material, of suitable size to inclose the mechanism used to impart the desired motion to the index-hands *a a' b b'*. These index-hands are made in different colors, and they revolve on axles *c c' d d'* over the dial B, which is marked on the upper part of the face-plate of the box A. The lower portion of this face-plate is occupied by two sets of keys, C C* C' C'*, which are either colored in different colors or made of material showing different colors corresponding to the colors of the index-hands—for instance, one black and the other yellow—so that they can be easily distinguished by the players. They (the keys) are secured to the outer ends of stickers *e e* e' e'**, and their faces are made concave, as shown in Fig. 3, so that the players can readily depress them with their cues.

Each set consists of eleven keys, ten of which are marked with figures from 1 to 10, and the eleventh with the figure 100, as shown in Fig. 1, and the stickers to which the ten keys C or C' of each set are secured connect with the index-hands *a* or *a'*, so that by depressing one of said keys the appropriate index-hand is moved for a number of degrees corresponding to the figure marked on said key, whereas the keys C* C'* (which are marked with the figures 100) connect with the mechanism and index-hands *a a'* in such a manner that by depressing one of said keys the appropriate index-hand, no matter where it happens to stand, is turned to the starting-point of the dial.

The stickers *e e'* are rods, which are guided in a frame, D, secured in the lower part of the box A, and each sticker is subjected to the action of a spring, *f*, which has a tendency to force the same out until a stop, *g*, strikes against the inner surface of one of the longitudinal bars of the frame D, as seen particularly in Fig. 4 of the drawings. Each of the stickers acts on one of the levers *h*, which serve to raise or depress a series of sliding stops, *i*, having their bearings in segmental guide-plates *j*, which extend across the frame

A. The levers $h$ have their fulcra in standards $k$, which rise from the back plate of the case, and their upper ends are pivoted to the stops $i$, whereas their lower ends connect by pivots $l$ with double-acting tappets $m$, the fulcra of which are in standards $n$, rising from the back plate of the case A. The ends of these tappets form noses $o$ $o'$, which catch in staples $p$ $p$, secured to the stickers $e$ $e'$, as shown in Fig. 4 of the drawings, so that by depressing the sticker $e$, Fig. 3, the staple attached to the same, while passing the nose $o$, forces the lower end of the lever $h$ back, thereby causing the stop $i$ to move out toward the front plate of the case A, and by depressing the sticker $e'$ the lower end of the lever $h$ is thrown forward and the stop $i$ is caused to move back toward the back plate of the case. This motion of the stops $i$ takes place at the beginning of the back motion of the stickers, and as this motion continues the inner ends of said stickers come in contact with the arms $q$ $q'$ of bell-crank levers $q$ $r$ $q'$ $r'$, said arms $q$ $q'$ being formed by plates extending throughout the entire length of the case A, and provided with gudgeons which work within lugs $s$ rising from the back plate of the case, and form the fulcra for the bell-crank levers $q$ $r$ $q'$ $r'$.

The arm $r$ of the bell-crank lever $q$ $r$ connects with a lever, $t$, which has its fulcrum on a pivot, $v$, and the outer end of which is attached to a rod, $u$, whereas the arm $r'$ of the bell-crank lever $q'$ $r'$ is attached directly to the rod $u'$, and rods $u$ $u'$ form the connection between the bell-crank levers $q$ $r$ $q'$ $r'$ and the toothed racks $w$ $w'$, which serve to impart motion to the registering devices, one of which serves to impart motion to the index-hand $a$ and the other to the index-hand $a'$.

The registering devices consist, principally, of ratchet-wheels $a^2$ $a^3$, which are mounted one on the hollow arbor $c$, which carries the index-hand $a$, and the other on the solid arbor $c'$, which carries the index-hand $a'$, and said ratchet-wheels are turned the desired distance by the action of lever-pawls $b^2$ $b^3$, which are pivoted to arms $c^2$ $c^3$ extending from sleeves $d^2$ $d^3$, that are placed loosely on the solid arbor $c'$, as shown particularly in Fig. 3 of the drawings.

On the sleeves $d^2$ $d^3$ are mounted loosely the pinions $e^2$ $e^3$, which gear in the toothed racks $w$ $w'$, and from which extend radiating plates $f^2$ $f^3$ in close proximity to the arms $c^2$ $c^3$, which carry the pawls $b^2$ $b^3$. Said pawls are made in the form of bell-cranks, pivoted to the arm $c^2$ at $b''$, and they are provided with pins $g^2$ $g^3$, which catch in holes or slots in the outer ends of the radiating plates $f^2$ $f^3$.

The racks $w$ $w'$ are subjected to the action of springs $h^2$, (see Fig. 2,) which have a tendency to pull the same upward, and by the actions of these springs on the racks and pinions $e^2$ $e^3$ the radiating plates $f^2$ $f^3$ are brought in such a position that the pawls $b^2$ $b^3$ are thrown out of gear with the ratchet-wheels $a^2$ $a^3$; but as soon as a downward strain is exerted on one of the racks the pinion-gearing in said rack begins to turn, and by the action of the radiating plate $f^2$ or $f^3$ on the pivot $g^2$ or $g^3$ the appropriate pawl $b^2$ or $b^3$ is slightly turned on its pivot and thrown in gear with the ratchet-wheel $a^2$ or $a^3$, and as soon as this takes place the further motion of the rack $w$ or $w'$ is transmitted to the ratchet-wheel $a^2$ or $a^3$, and through the same to the index-hand $a$ or $a'$.

In order to prevent the pawl $b^2$ $b^3$ bearing too hard on the teeth of the ratchet-wheels, the arms $c^2$ $c^3$ are connected to the radiating plates $f^2$ $f^3$ by pins $r^2$ $r^3$, which travel in slots in the arms and permit the same to move just far enough to bring the points of the pawls in gear with the ratchet-wheels. The amount of motion imparted to the ratchet-wheels and index-hands by depressing one of the stickers $e$ or $e'$ is determined by eccentric arcs $i^2$ $i^3$, which extend from the sleeves $d^2$ $d^3$. The number of teeth of each of these eccentric arcs corresponds to the number of regular keys in each set—that is to say, if the number of the keys C or C′ is ten, the number of teeth in each arc is also ten—and said teeth are so situated that when one of the keys marked with the figure 1 is depressed the first tooth of the appropriate arc fetches up against the first stop $i$ and the appropriate ratchet-wheel is allowed to turn sufficient to propel its index-hand one degree, and if the key marked 8 is depressed the index-hand is allowed to move eight degrees, and so on.

In order to prevent the players from continuing the game beyond the proper time, the registering devices are so arranged that each of them stops whenever the appropriate index-hands return to the starting-point. This object is effected by stops $k^2$ $k^3$, which are secured in lugs or ears $l^2$ $l^3$, attached to the ratchet-wheel $a^2$ $a^3$, and which fetch up against the ends of arms $m^2$ $m^3$.

The arms $m^2$ $m^3$ are secured to rock-shafts $n^2$ $n^3$, which have their bearings in a suitable frame, F, secured in the upper part of the case A, and which run parallel to each other, as clearly shown in Fig. 3. Each of these rock-shafts carries an additional arm, $o^2$ $o^3$, on the ends opposite to the arms $m^2$ and $n^3$, and the outer ends of these additional arms form inclined planes, so that pins $p^2$ $p^3$ projecting from the lugs $l^2$ $l^3$ are enabled to pass under them and to raise the arms $o^2$ $o^3$. For instance, if the yellow index-hand $a$ is on the starting-point of the dial-plate, the stop $k^2$ fetches up against the end of the arm $m^2$ and the stop $p^3$ passes under the arm $o^3$ and raises the same. In this position the wheel $a^2$ cannot be turned until the black index-hand $a'$ is also turned to the starting-point, whereby the stop $p^2$ is caused to pass under the inclined end of the arm $o^2$, causing the same to rise and to turn the rock-shaft $n^2$, so as to throw the end of the arm $m^2$

off from the stop $k^2$, and since, by the action of the pin $p^3$, the arm $o^3$ is raised, whereby the shaft $n^3$ and arm $m^3$ are brought in such a position that the wheel $a^3$ is free to revolve, and consequently the play can now proceed. Before either of the ratchet-wheels $a^2$ $a^3$ is permitted to move ahead, however, after its index-hand has reached the starting-point, it is necessary to raise a hook-catch, $s^2$ or $s^3$, which catches behind a pin, $t^2$ or $t^3$, secured in the frame F. Said hook-catches are pivoted to the rims of the ratchet-wheels $a^2$ $a^3$, as seen particularly in Figs. 2 and 6, and they are provided with pins $u^2$ $u^3$ in their tail ends, which are so situated that stops $v^2$, secured in the arms $c^2$ $c^3$, by sweeping past them in going back, throw the hook-catches off from the pins $t^2$ $t^3$ in the frame F and permit the ratchet-wheels to proceed. The object of this arrangement is to prevent either of the index-hands $a$ $a'$ from passing the starting-point in case its stop-lever should happen to be raised. For instance, if the index-hand $a'$ points on the starting-point and the player controlling the index-hand $a$ plays all around, his index-hand is arrested at the starting-point by the hook-catch—that is to say, if the index-hand stands on 96 and the player depresses the key marked 8, the hook-catch $s^2$ will retain the ratchet-wheel $w$ exactly at the starting-point; but the stop $v^2$ in the arm $c^2$, as the same returns, when the key is released, throws the hook-catch out of contact with the pin $t^2$, and the play can proceed, as previously described.

The keys marked 100 serve to carry the ratchet-wheels $a^2$ $a^3$ clear round until the stops $k^2$ $k^3$ strike the ends of the levers $m^2$ $m^3$, their connection with the racks $w$ $w'$ being such that they act on the same without raising or depressing either of the stop-pins $i$.

It remains to explain the connection between the index-hands $a$ $d'$ $b$ $b'$ and the manner in which the requisite motion is imparted to the latter hands so as to indicate the number of games played.

The index-hand $b$ is mounted on a tubular shaft, $d$, through which passes the solid shaft $d'$, to which the index-hand $b'$ is secured. (See Fig. 3.) On each of these shafts is mounted a ratchet-wheel, $w^2$ $w^3$, and an intermittent rotary motion is imparted to said shaft by the action of lever-pawls $a^4$ $a^5$, which engage with the teeth of the ratchet-wheels $w^2$ $w^3$. Said lever-pawls are pivoted to a rocking beam, $b^4$, which has its fulcrum on a suitable standard, $b^5$, rising from the back plate of the frame F, and their lower ends are guided in angular brackets $c^4$ $c^5$, secured to the front and back plates of the frame F, as shown in Fig. 3.

A rising and falling motion is imparted to the lever-pawls by the action of wedge-shaped pins $e^4$ $e^5$, secured in suitable brackets or plates on the wheels $a^2$ $a^3$. These wedge-shaped pins act on pins $d^4$ $d^5$, secured in the lower ends of the lever-pawls $a^4$ $a^5$, and cause them to rise just at the moment when the index-hands $a$ $a'$ reach the starting-point, and by these means the index-hands $b$ $b'$ are turned one degree for each game. In this operation it is desirable, however, that the motion of one index-hand is made dependent on the other, so that only one of the index-hands, $b$ or $b'$, will be moved at the end of each game and each player will be able to see how many games he has lost. This purpose is effected by securing the lever-pawls $a^4$ $a^5$ to the rocking beam $b^4$, and by using additional inclined planes $f^4$ $f^5$, which are secured to the wheels $a^2$ $a^3$ close over the wedge-shaped pins $e^4$ $e^5$.

At the beginning of the operation the pins $d^4$ $d^5$ in the lever-pawls $a^4$ $a^5$ are situated at such a height that either of them will be acted on by the inclined plane $f^4$ or $f^5$, the pin $d^4$ if the index-hand $a$ completes the circuit first and the pin $d^5$ if the index-hand $a'$ completes the circuit first. By the action of the inclined plane $f^4$, for instance, the lever-pawl $a^4$ is raised and the index-hand $b$ is propelled one degree. At the same time, by the action of the lever-pawl $a^4$ on the rocking beam $b^4$, the lever-pawl $a^5$ is depressed, and if now the wheel $a^3$ is made to revolve in order to bring the index-hand $a'$ opposite the starting-point, the effect of the lower inclined plane or wedge-shaped pin $e^5$ on the pin $d^5$ simply is to raise the lever-pawl $a^5$ and depress lever-pawl $a^4$ to their original positions without producing any motion of the index-hand $b'$. It is obvious that if the index-hand $a'$ completes its circuit first the index-hand $b'$ will be propelled one degree and the hand $b$ will remain stationary.

By this arrangement each player is enabled to tell at any time how many games he has lost or gained, and at the same time the interest of the proprietor of the billiard-table is fully protected.

What we claim as new, and desire to secure by Letters Patent, is—

1. The use, in a billiard-indicator, of concave keys or buttons C C′, substantially such as herein described, so that the points of the cues are not liable to slip thereon when the players wish to force the same in.

2. The keys C C′, in combination with rockers $m$, levers $h$, and stop-pins $i$, substantially as and for the purposes set forth.

3. The keys C C′, in combination with elbow-levers $q$ $r$ $q'$ $r'$, racks $w$ $w'$, and index-hands $a$ $a'$, constructed and operating substantially as and for the purpose described.

4. The serrated arms $i^2$ $i^3$, in combination with stops $i$, keys C C′, racks $w$ $w'$, and index-hands $a$ $a'$, constructed and operating substantially as and for the purpose set forth.

5. The racks $w$ $w'$ and pinions $e^2$ $e^3$, in combination with the radiating plates $f^2$ $f^3$, arms $c^2$ $c^3$, pawls $b^2$ $b^3$, ratchet-wheels $a^2$ $a^3$, and index-hands $a$ $a'$, constructed and operating substantially as and for the purpose described.

6. The levers $m^2$ $m^3$ and inclined planes $o^2$ $o^3$, in combination with the stops $k^2$ $k^3$, lifters $p^2$

$p^3$, and ratchet-wheels $a^2$ $a^3$, constructed and operating substantially as and for the purpose set forth.

7. The additional hook-catches $s^2$ $s^3$, in combination with the ratchet-wheels $a^2$ $a^3$ and index-hands $a$ $a'$, constructed and operating substantially as and for the purpose described.

8. The pawls $a^4$ $a^5$ and ratchet-wheels $w^2$ $w^3$, in combination with the ratchet-wheels $a^2$ $a^3$, and with the index-hands $a$ $a'$ and $b$ $b'$, as and for the purpose set forth.

9. The inclined planes $e^4$ $e^5$ $f^4$ $f^5$, in combination with the pawls $a^4$ $a^5$ and index-hands $a$ $a'$ $b$ $b'$, constructed and operating substantially as and for the purpose described.

10. The keys C* C'*, in combination with the ratchet-wheels $a^2$ $a^3$ and index-hands $a$ $a'$, constructed and operating substantially as for the purpose set forth.

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