No. 651,601. Patented June 12, 1900.

F. X. GANTER.

BOWLING ALLEY.

(Application filed July 21, 1899.)

(No Model.) 2 Sheets—Sheet 1.

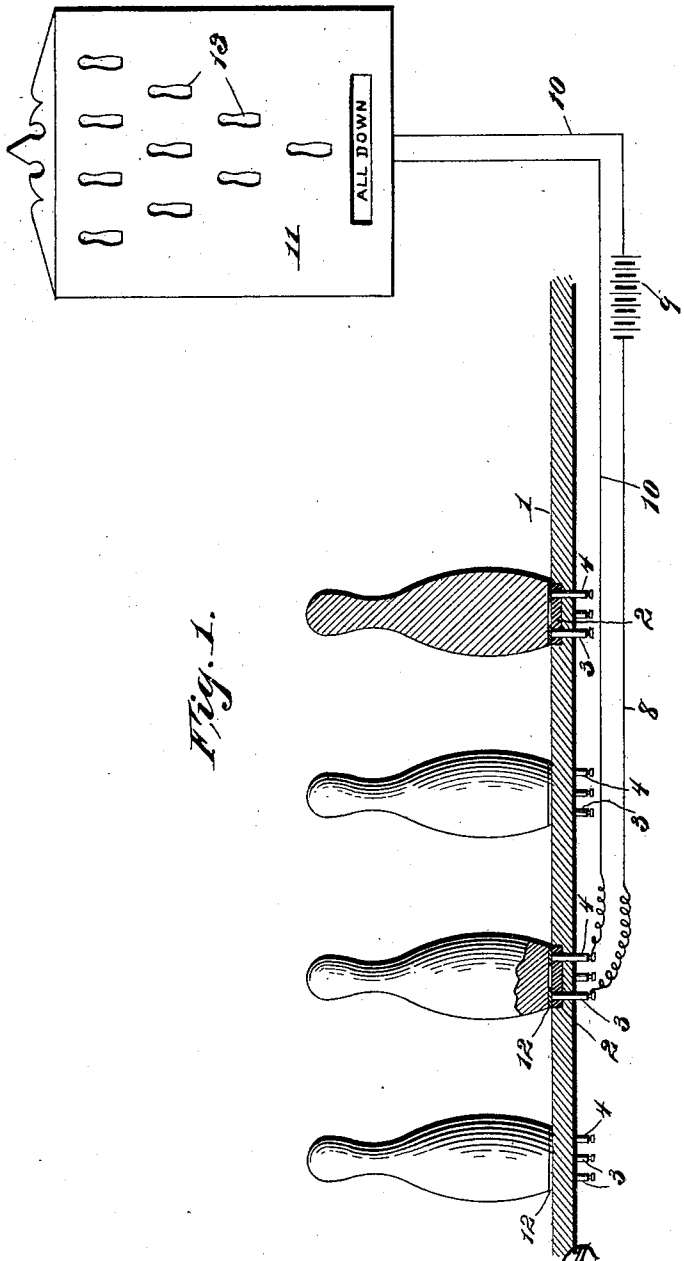


Fig. 1.

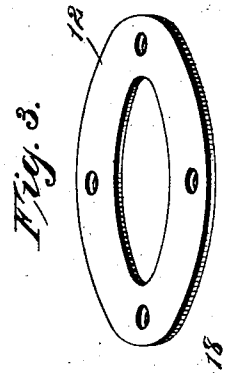


Fig. 3.

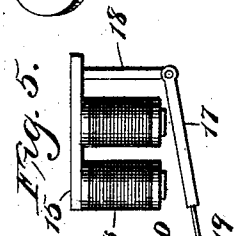


Fig. 5.

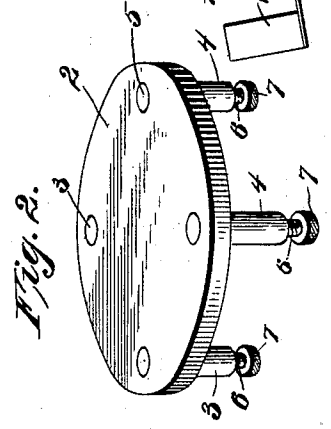


Fig. 2.

Witnesses

Louis D. Heinrichs.

F. W. McCleary.

Francis X. Ganter, Inventor

By Kenny E. Wilkens Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 651,601. Patented June 12, 1900.

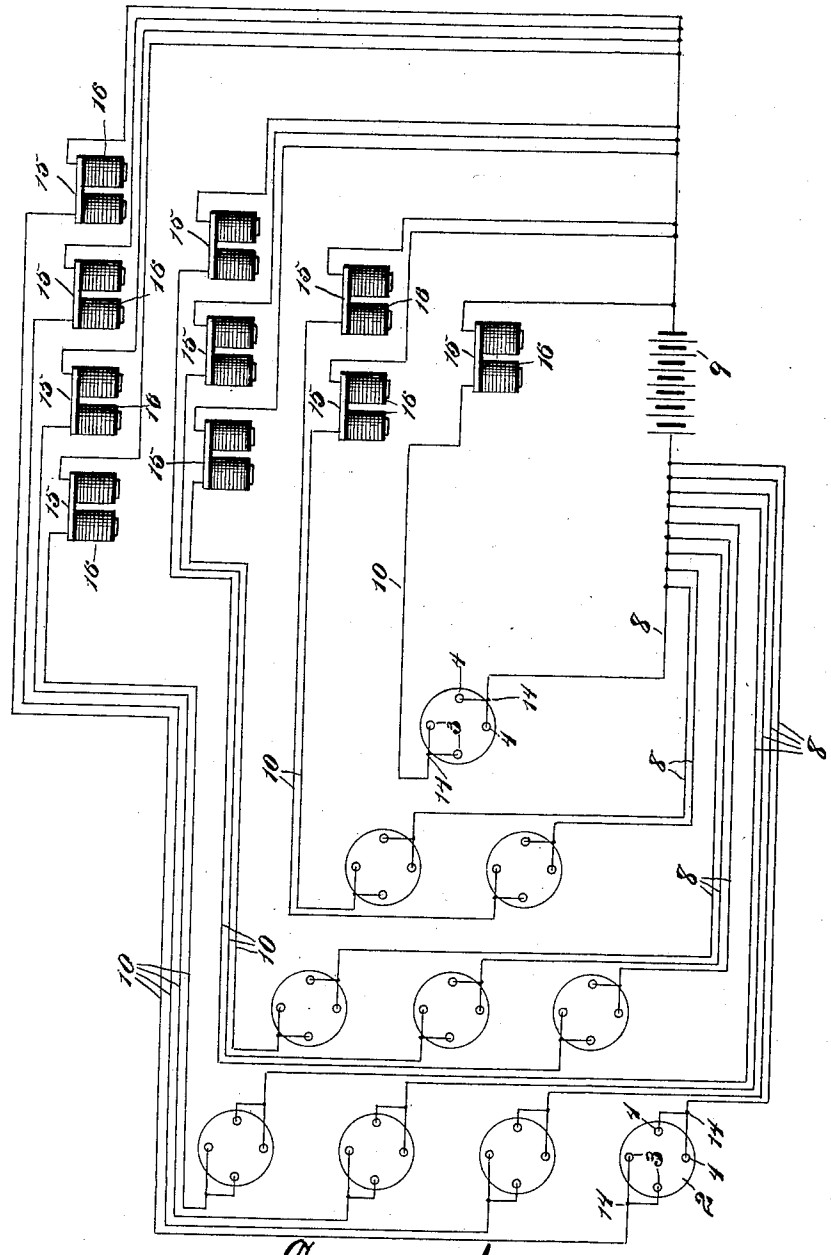
F. X. GANTER.

BOWLING ALLEY.

(Application filed July 21, 1899.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 4.



WITNESSES

Louis D. Heinrichs

F. D. McElleary,

Francis X. Ganter INVENTOR

By Henry Wilkens Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

FRANCIS X. GANTER, OF BALTIMORE, MARYLAND.

BOWLING-ALLEY.

SPECIFICATION forming part of Letters Patent No. 651,601, dated June 12, 1900.

Application filed July 21, 1899. Serial No. 724,676. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS X. GANTER, a citizen of the United States, residing at Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Bowling-Alleys; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in tenpin-alleys, and more particularly to means for automatically indicating the result of each play or roll.

The primary object of the invention is to provide an indicator with which each of the tenpins is adapted to be independently connected electrically, so that when any pin is knocked down by the rolled ball the result will at once be shown by the indicator located at any convenient place for the inspection of the players or others.

The invention consists, broadly, in the combination, with an indicator, of contact points or spots located at the rear end of the alley and electrically connected with the indicator and tenpins provided with conductors which serve as circuit-closers.

The construction of the improvement will be fully described hereinafter and its novel features defined in the appended claims in connection with the accompanying drawings, in which—

Figure 1 is a sectional side elevation of a portion of a bowling-alley combined with an indicator embodying the invention. Fig. 2 is an enlarged view in perspective of one of the contact-spots of the alley. Fig. 3 is a similar view of a metal ring adapted to be secured to the bottom of each of the tenpins. Fig. 4 is a diagram illustrating the circuit connections between the spots or contact-points of the alley and the indicator, and Fig. 5 is a detail side elevation of one of the magnets and armatures of the indicator.

The reference-numeral 1 designates the floor or trackway of the alley, which is recessed at the points over which the pins are placed to receive a disk 2, of rubber or other non-conducting material.

3 and 4 designate metallic rods extending through the floor or trackway of the alley and through the disks 2, the upper surfaces 5 of said rods resting flush with the upper surfaces of the disks and constituting electrical contact-points. These rods are connected by conductors to an indicator, as will be described more fully hereinafter. To facilitate the attachment of the conducting-wires to the rods, the lower ends 6 of the latter are circumferentially reduced and screw-threaded to receive thumb-nuts 7, which secure the wires, the rods thus constituting binding-posts.

Referring to Fig. 1, 8 designates a wire conductor secured to the binding-post 3 and leading from one pole of a battery 9, while 10 designates a conductor secured to the binding-post 4 and thence passing to an indicator 11 and back to the opposite pole of the battery. Inasmuch as the binding-posts 3 and 4 are insulated from each other by the rubber disk 2, there is a break in the circuit at this point, which is closed as soon as the pin is placed on the disk by means of a metallic ring 12, which is secured by screws or other means to the bottom of the pin.

It will be understood that there is a disk 2 for each of the tenpins, said disks being independently connected by suitable conductors, as above described, with the indicator.

While the invention is not restricted to any particular construction of indicator, I preferably employ one having its openings 13 and indicating-drops arranged, as shown in Fig. 1, to correspond to the relative arrangement of the pins as they are set up at the end of the alley, so that the indicator will not only show how many pins have been knocked down, but will also accurately indicate the relative positions of the pins which remain standing. I also prefer that the exposure-apertures 13 of the indicator should be of the shape or contour of a tenpin, as shown.

The details of the wiring between the contact-spots and the indicator will be readily understood by those skilled in the art to which the invention relates; but the diagram shown in Fig. 4 illustrates a system of wiring which is practical for the purpose in view. In this

figure four contact-points 3 3 and 4 4 are provided for each disk 2, the conductors 8 and 10 for each disk being branched, as at 14.

The electromagnets 16 and connecting-plates 15 of the indicator may be of any approved construction, these features not constituting part of my invention, except as elements of the combination hereinafter claimed.

At the bottom of the indicator I provide a large aperture to indicate that all the pins are down, as in strikes and spares.

In Fig. 5 I show one of the magnets 16 with an armature 17 in operative relation thereto, said armature being pivoted upon a rod 18 and having a projecting rod 19 at its free end, carrying a drop 20.

It will be apparent that the pins must be placed directly over the contact-spots in order to close the circuit, and hence any negligence on the part of the attendant setting the pins may be readily detected.

A further advantage of the invention is found in the fact that in contest games the calling out of the result of the balls to the scorer is avoided. Again, the metallic ring at the bottom of the pin serves to strengthen the pin and protect it from the usual wear incident to careless handling.

The indicator may be located at a distance from the alley, to be viewed by spectators in a hall or elsewhere when prize games are being played.

I claim—

1. In a bowling-alley, the combination with an indicator, of contact points or spots located at the rear end of the alley and electrically connected to the indicator, and tenpins provided with conductors which serve as circuit-closers.

2. In a bowling-alley, the combination with an indicator having apertures arranged to correspond to the relative arrangement of the tenpins as set up in the alley, of contact points or spots located in the floor or trackway of the alley, and electrically connected to the indicator, and tenpins provided with conductors which serve as circuit-closers.

3. In a bowling-alley, the combination with an indicator, of spots located in the floor of the alley and comprising disks of non-conducting material, and contact-points electrically connected to the indicator, and tenpins provided with metal plates at their bottoms to electrically connect the opposing contact-points of the spots.

4. The combination with a bowling-alley having its floor or trackway recessed at the points where the pins are set, of disks of non-conducting material located in said recesses, contact-pins extending through the disks and the floor of the alley, an indicator to which the contact-pins are electrically connected independently, and tenpins provided on their bottoms with metallic rings or plates adapted to electrically connect the opposing contact-points of each disk.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS X. GANTER.

Witnesses:
CHAS. F. W. GANTER,
HARRY L. STUART.