J. P. KEENAN.

BOWLING ALLEY.

APPLICATION FILED JAN. 6, 1912.

1,025,808. **Patented May 7, 1912.**

Fig. 1.

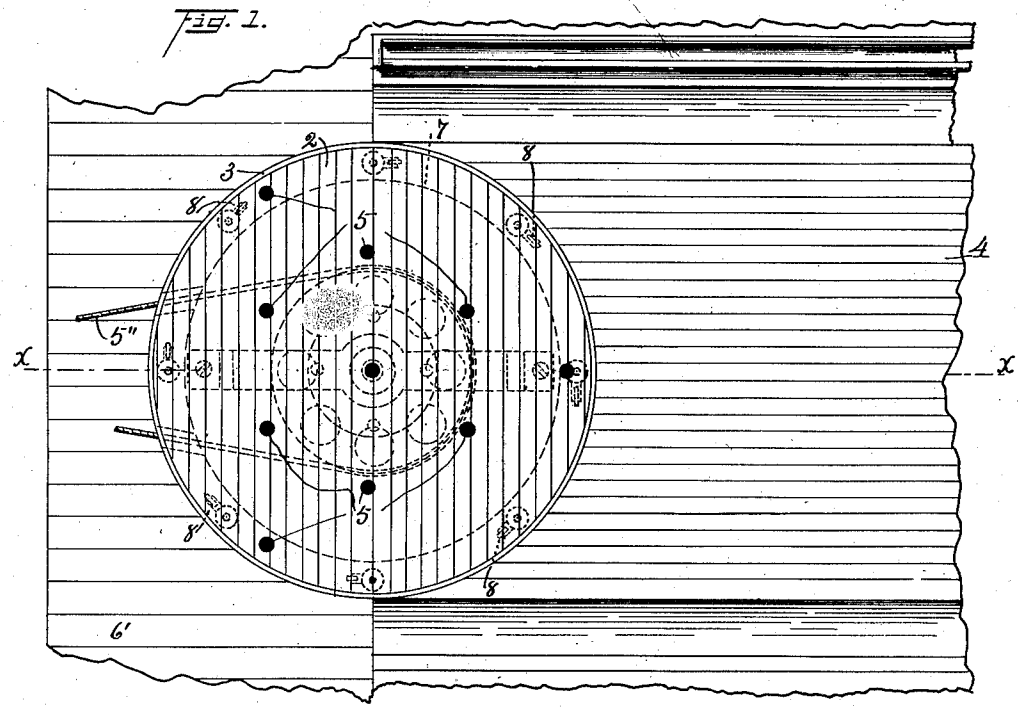


Fig. 2.

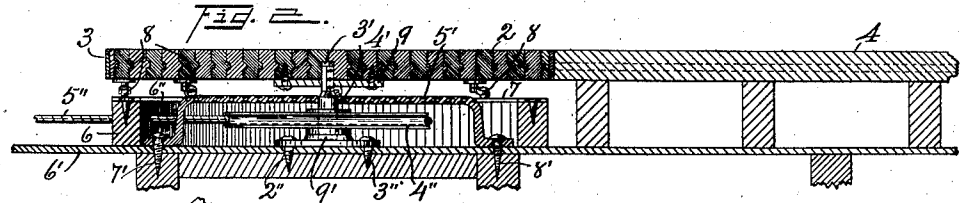


Fig. 3.

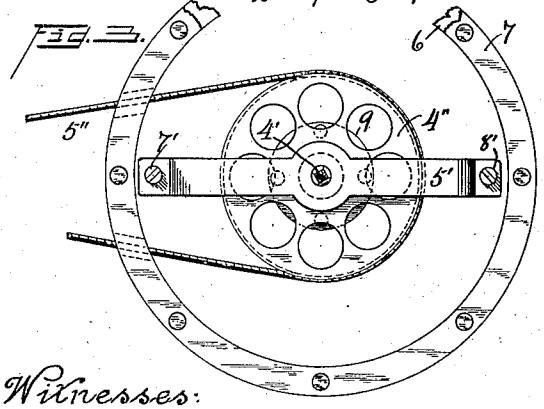
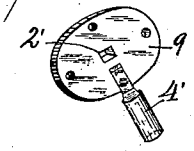


Fig. 4.



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UNITED STATES PATENT OFFICE.

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BOWLING-ALLEY.

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To all whom it may concern:

Be it known that I, JOSEPH P. KEENAN, a citizen of the United States, and a resident of Waterbury, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Bowling-Alleys, which improvements are fully set forth in the following specification.

This invention relates to improvements in game devices of that class commonly known as bowling alleys; and its object is to provide a bowling alley which shall be simple and comparatively inexpensive as regards construction; durable, efficient and reliable in practical service; which shall embody novel features whereby is insured the maintenance in motion of the respective pins to be bowled over, thereby eliciting the exercise of the utmost skill and cleverness on the part of each player making use of the device; and which shall possess certain well-defined advantages over prior analogous constructions.

The invention consists in the combinations, details and parts whereby, together with the novel disposition and relative arrangement of said parts, the attainment of the foregoing object is rendered practicable, all of which will be hereinafter more specifically referred to and set forth in the appended claims.

The invention is clearly illustrated in the accompanying drawings, wherein similar reference-numerals denote like parts throughout the respective views, as to which:

Figure 1 is a plan view of a fragment of a bowling alley embodying my said improvements. Fig. 2 is a central, vertical, longitudinal section of same, as along the line *x*—*x* of Fig. 1. Fig. 3 is a detail plan view showing more particularly the driving mechanism and adjacent parts made use of, and disclosed upon removal of the pin-supporting bed. Fig. 4 is a detail view showing in perspective certain minor coöperating parts of the device.

In carrying out my invention, reference being had to the accompanying drawings, I make use of a circular pin-supporting bed 2, of any appropriate construction, though preferably formed of tongued and grooved strips or members, held snugly together by a peripheral band 3, as clearly illustrated in the drawings. Bed 2, with the band 3 thereon, when used, fits with fair accuracy into a semi-circular recess formed in the distant end of the alley floor 4, with its upper surface, which bears the pin-spots 5, flush with the upper surface of the latter, said semi-circular recess and said bed coinciding in radii, and said floor being of any appropriate and well-known construction.

6 denotes a circular, upright rail which essentially supports the bed 2, and which is preferably surmounted by a flat annulus 7, of metal or other suitable material, said annulus having a smooth upper surface constituting a trackway.

Anti-friction devices 8, each conveniently in the form of a caster, are interposed between the rail 6 and the bed 2, the same being, in this instance, attached to the bed 2 at appropriate intervals along the under margin thereof, and adapted to engage and roll along the rail 6, or the trackway aforenamed formed by the annulus 7, when the latter is used, said anti-friction devices, accordingly, serving to incidentally support the bed 2 relatively to the rail 6, and permit free rotative movement thereof, as will be hereinafter more fully explained.

There is attached centrally to the bed 2, at its under side, a plate 9, which has a central opening 2′ provided with a flat side, or a plurality of flat sides, as clearly indicated in the drawings; and ordinarily the bed 2 will have a socket 3′ in registry with the opening 2′.

4′ denotes an upright arbor, whose upper portion is provided with a flat side, or a plurality of flat sides, as clearly indicated in the drawings, and adapted to enter and fit the opening 2′ in such a manner that bed 2 will be rotated upon impartation to said arbor of a corresponding movement, the socket 3′, aforenamed, permitting the upper portion of the arbor 4′ to project through and somewhat beyond the plate 9, by way of the opening 2′, aforenamed.

It will be here noted that the foregoing construction leaves the bed 2, at all times, in readiness to be lifted from, or replaced upon, the rail 6, without the necessity of loosening a fastener or fasteners of any description whatever.

The arbor 4′ bears midway its length in a yoke 5′, secured, as to the permanent floor 6′, by means of suitable fasteners 7′, 8′, and at its lower end in a cup-bearing 9′, strad-

dled by the yoke aforenamed, and also secured to the floor 6′ by means of suitable fasteners, as the screws 2″, 3″.

4″ is a sheave fast on the arbor 4′, and on which operates a belt 5″, leading from any appropriate source of power and motion, and, in this instance, passing through opposite openings 6″ formed at suitable points in the rail 6.

It will be seen that the arbor 4′ serves to determine the axis of movement of the bed 2, and also the axis of the semi-circular recess formed in the alley floor 4, and, as may be found desirable in practice, the joint between the bed 2 and the floor 4 may be kept duly lubricated.

In the operation of my improved bowling alley, a slow rotative movement is imparted, through the medium of the sheave 4″ and the belt 5″ operating thereon, or any other appropriate transmission mechanism, to the arbor 4′, which, in turn, transmits its slow rotative movement thus received, to the bed 2. Hence, the bowling-pins, as customarily employed in the so-called game of bowling, being placed, each in an upright position on one of the spots 5, and so as to collectively form substantially the figure outlined by the spots 5 collectively, are presented, as a body, at continuously varying angles to the player, thereby inducing him to exercise his greatest skill and judgment in endeavoring to bowl over the bowling-pins by means of the ball commonly made use of in the progress of the so-called game of bowling. Again, it will be seen that, by reason of the provisions whereby the bed 2 is rendered easily removable from and replaceable upon, the rail 6, access to the arbor 4′ and parts coöperating therewith, for purposes of repairs, adjustments, or the like, may be readily had.

It will be further seen that my improved bowling alley is particularly well adapted for the purposes for which it is intended, and also that the same may be modified to a considerable extent, particularly as regards the means made use of for moving the pin-supporting bed relatively to the floor 4, whereby the pins supported by said bed are presented at varying angles to the player, and various minor details of the general construction, without materially departing from the spirit and principle of my invention.

I claim:

1. A bowling alley comprising an alley floor, a pin-supporting bed movable relatively to said floor, and means for moving said bed.

2. A bowling alley comprising an alley floor having a semi-circular recess at its distant end, a circular pin-supporting bed movable within the recess of said floor and relatively thereto, and means for moving said bed.

3. A bowling alley comprising an alley floor, a circular rail at the distant end of said floor, a pin-supporting bed movable on said rail and relatively to the floor aforenamed, and means for moving said bed.

4. A bowling alley comprising an alley floor, an annular trackway at the distant end of said floor, a pin-supporting bed having an anti-frictional contact with, and movable concentrically to and along said trackway relatively to the floor aforenamed, and means for moving said bed.

5. A bowling alley comprising an alley floor having a semi-circular recess at its distant end, an annular trackway also at the distant end of said floor, a pin-supporting bed movable on said trackway, an upright arbor engaging said bed and turning as a unit therewith, said arbor determining the axis of movement of said bed and the axis of the semi-circular recess aforenamed, and means for rotating said arbor.

6. In a bowling alley, in combination, an annular trackway, a pin-supporting bed mounted on said trackway for movement concentrically thereto; and an upright arbor, the latter projecting centrally into said bed and movable rotarily only therewith.

7. In a bowling alley, in combination, an annular trackway, a pin-supporting bed mounted on said trackway, for movement concentrically thereto, said bed carrying centrally at its under side, a plate provided with a central, flat-sided opening, and an upright arbor, the latter having a flattened portion projecting into the opening of said plate, whereby is insured a rotary movement only of said arbor as a unit with said bed.

8. A bowling alley comprising a pin-supporting bed, means for supporting said bed for movement rotarily, an arbor engaging said bed for movement rotarily therewith, a sheave on said arbor, and a driving belt, the latter operating on said sheave.

9. A bowling alley comprising an alley floor having a semi-circular recess at its distant end, a pin-supporting bed movable within the recess of said floor and relatively thereto, means for movably supporting said bed, a bearing centrally beneath the same, a yoke straddling said bearing, an upright arbor operating in said bearing and yoke, respectively, and engaging the bed aforenamed to turn as a unit therewith, and means for actuating said arbor.

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