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J. R. KAISERMAN

2,194,146

BOWLING ALLEY

Filed Feb. 6, 1939

Fig. 1.

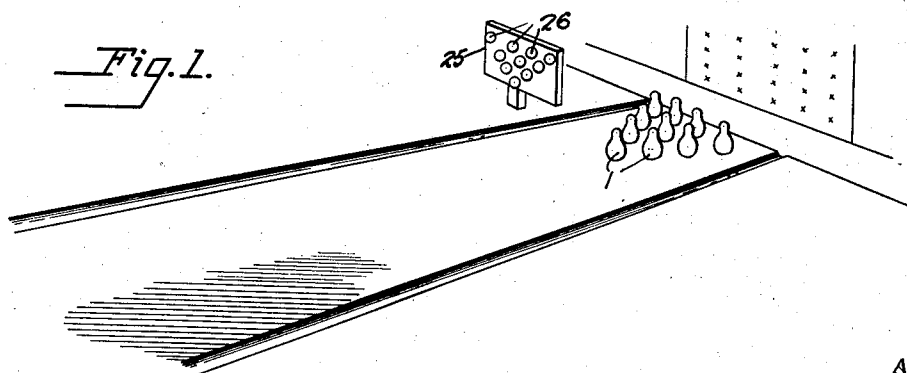


Fig. 3.

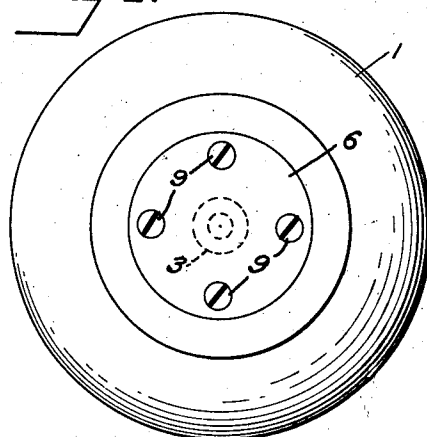


Fig. 2.

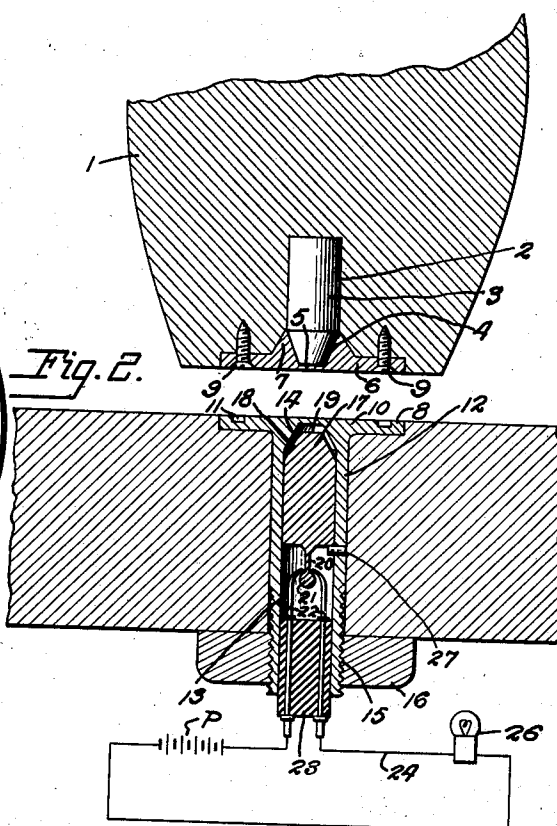
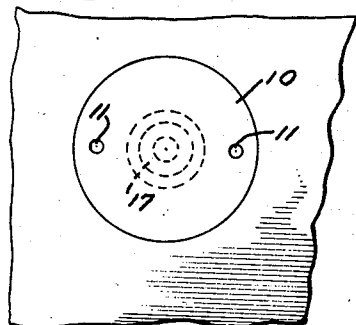


Fig. 4.



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BOWLING ALLEY

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5 Claims. (Cl. 273—46)

This invention relates to bowling alleys and more particularly to improved means for indicating to the player when the ten pins have been accurately set up.

Devices of this general character are known but are generally open to the objection that mechanism carried by the respective ten pins is subject to severe shocks and apt to be jammed or otherwise injured in playing.

The object of the present invention is to provide improved and simplified mechanism for indicating the correct positioning of ten pins in a bowling alley.

A further object is to provide a device of the character indicated with no movable parts in the ten pin.

A further object is to provide a device of the character indicated, operated by magnetic means.

Further objects will appear in the course of the following detailed description.

The invention consists in the novel construction, arrangements, and combinations of parts, hereinafter more particularly described and claimed.

One sheet of drawings accompanies this specification as part thereof, in which like reference characters indicate like parts throughout.

Figure 1 is a perspective view of a bowling alley showing an indicator board and assembled ten pins;

Figure 2 is a fragmentary vertical cross-sectional view taken through a portion of a ten pin and a portion of the floor immediately thereunder, including one form of the present invention;

Figure 3 is a bottom plan view of a ten pin; and

Figure 4 is a plan view of the bowling alley floor showing a ten pin platform.

In accordance with the present invention each of the ten pins is provided with an axial bore 2 extending up from its bottom in which is positioned a permanent magnet 3 having its lower end beveled as at 4 to provide a reduced end face 5. An end plate 6 of non-magnetic material is countersunk into the end of the ten pin, being provided with an inwardly directed annular flange 7, having a tapered bore corresponding to and adapted to receive the beveled end of magnet 3. By the construction described it will be apparent that the reduced end face 5 of the magnet 3 is directed against a relatively thin portion of the non-magnetic material immediately beneath same, while the beveled faces of the magnet are surrounded by relatively deep portions of non-magnetic material, thus concentrating the mag-

netic field through the plate 6 to the portion immediately beneath the end face 5 of the magnet. The plate 6 is secured to the ten pin in any suitable manner here illustrated as by screws 9. In the floor of the bowling alley are positioned a plurality of ten pin platforms 10, arranged to conform with the desired set up of the ten pins, one platform for each ten pin. The structure of each of these platforms is identical, and a description of one applies to all.

Each platform comprises an annular plate 8 of non-magnetic material set into the floor and provided with spanner sockets 11. Projecting downwardly from platform 10 is a stud 12 having an internal bore 13, the upper end of the bore being beveled inwardly as at 14 to provide a relatively restricted, thin ceiling centrally of platform 10. Within the bore 13 is slidably mounted a permanent magnet 17, having its upper end beveled as at 18 to provide a reduced upper end face 19 of opposite polarity to the downwardly directed face 5 of the magnets in the ten pins. On the bottom of magnet 17 is a stem 20 carrying a contact member 21 positioned between two electrical contacts 22—22, which are mounted in a non-conductive plug 23, secured by tight frictional contact with the bore 13. A pin 27 is positioned in the side wall of stud 12 and projects into the bore 13 below magnet 17 to restrict the downward fall of magnet 17 to a position slightly below the face of the platform 10. In this lower position of magnet 17 contact 21 does not bridge contacts 22 but when magnet 17 is raised by the proximity of magnet 3 in a ten pin the circuit is completed through these contacts, circuit 24, signalling device, such as lamp 26 and the source of electric energy P. The lower end of stud 12 is externally threaded as at 15 by means of which the device is secured in the floor by a nut 16.

A board 25 is positioned adjacent the bowling alley, containing a plurality of the signalling lamps 26, and it will be apparent from the device as described that as each ten pin is accurately positioned over a ten pin platform, its magnet 3 will attract magnet 17 in the platform, thus completing the electrical circuit to that particular lamp on the board.

Various modifications in the particular constructions will readily suggest themselves to those skilled in the art but within the scope of the present invention as claimed.

Having thus fully described my invention I claim:

1. In a bowling alley a plurality of pin platforms, one for each ten pin, magnetic means

mounted in the base of each ten pin, magnetic means and magnet operated switch means in each pin platform means for concentrating the magnetic field of said magnetic means and signalling means electrically operated through said switch means for indicating when a ten pin is accurately positioned on a platform.

2. The combination specified in claim 1 in which the magnetic means in the ten pin and ten pin platform have their adjacent ends tapered and are arranged to be mutually attractive, whereby the magnetic means in the platform is raised when the base of the ten pin is accurately centered over the platform to operate the switch means.

3. The combination specified in claim 1 in which each of the magnetic means comprises a permanent magnet with a tapered end with non-magnetic means surrounding the said tapered magnet ends both in the base of the ten pin and the ten pin platform to concentrate the magnetic field between said means to a restricted area.

4. The combination specified in claim 1 in which the magnetic means in the ten pin and that in the ten pin platform each comprises a permanent magnet having their opposite pole ends tapered, said magnets arranged with said tapered opposite pole ends directed toward the bottom of the ten pin and the top of the ten pin platform.

5. The combination specified in claim 1 in which the magnetic means in the ten pin and that in the ten pin platform each comprises a permanent magnet, said magnets arranged with opposite poles directed toward the bottom of the ten pin and the top of the ten pin platform, said adjacent ends being tapered and surrounded with non-magnetic material, the magnet in the platform carrying a contact member and being slidable vertically, with switch contact members positioned to form an electric circuit only when said magnet is lifted from its normal position of repose.

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