June 6, 1939. G. R. FOSTER 2,161,704

BOWLING ALLEY GAUGE

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Fig. 1.

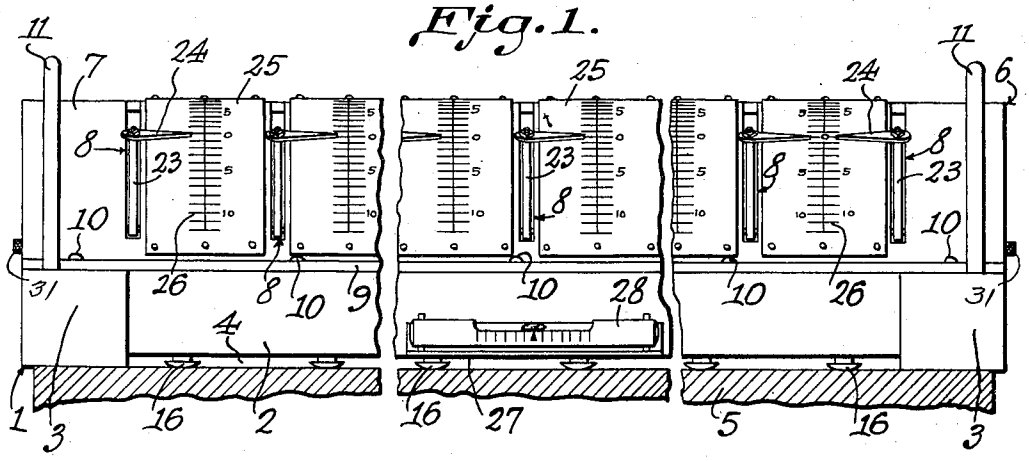


Fig. 2.

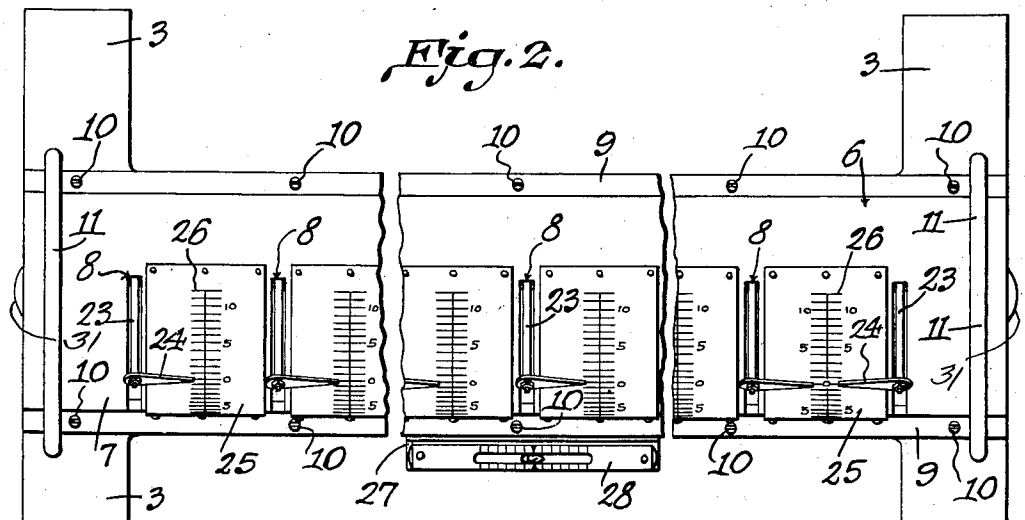
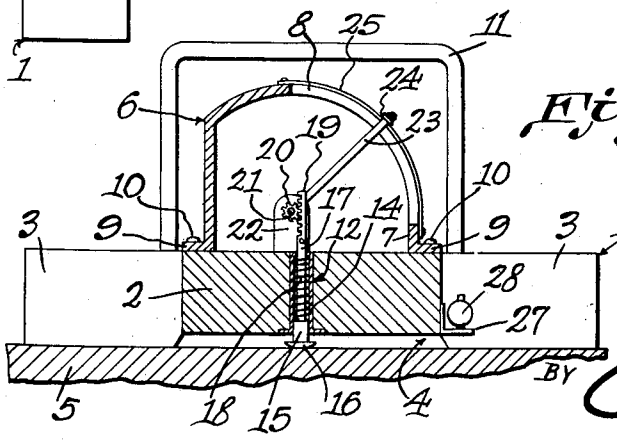


Fig. 3.



Garnett R. Foster
INVENTOR.

BY C. A. Snow & Co.
ATTORNEYS.

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Fig. 4.

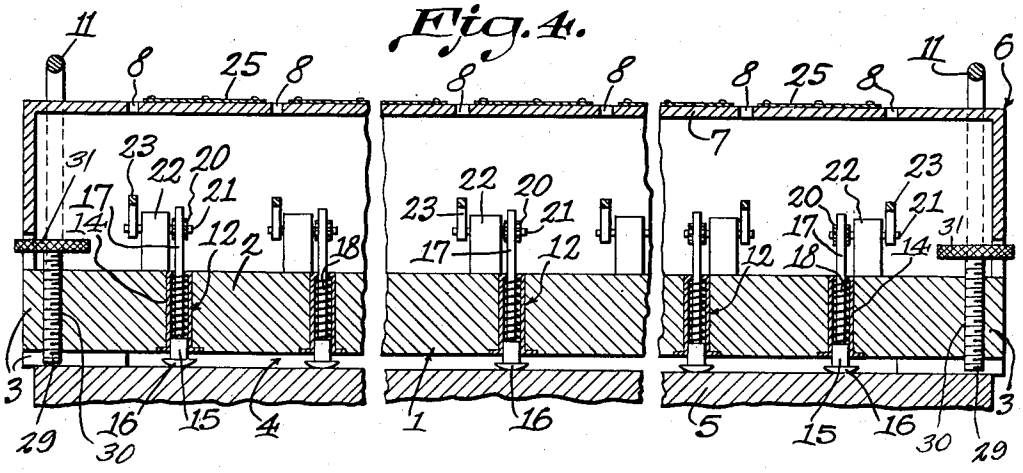


Fig. 5.

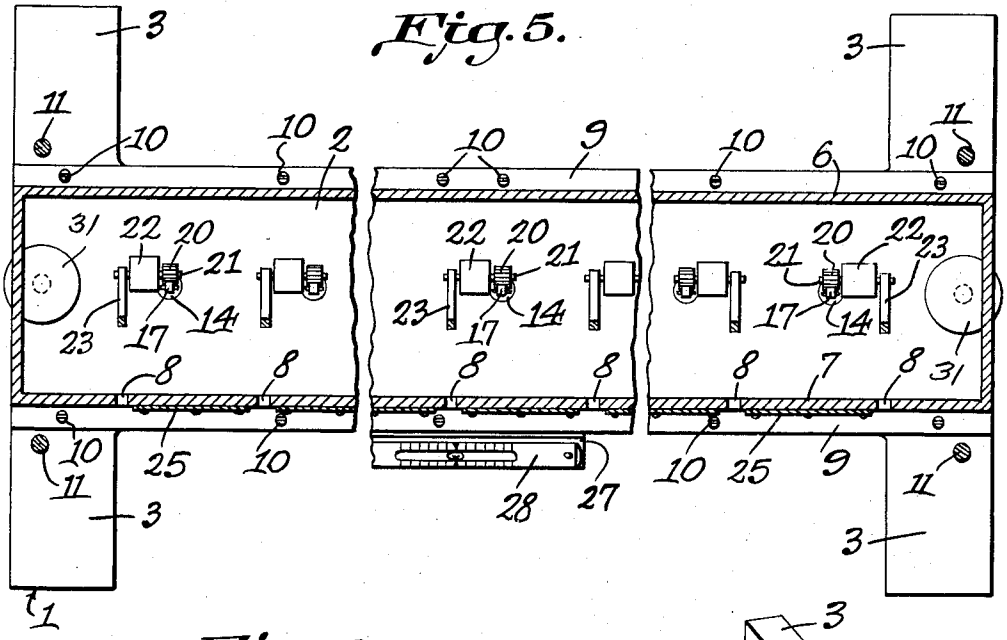
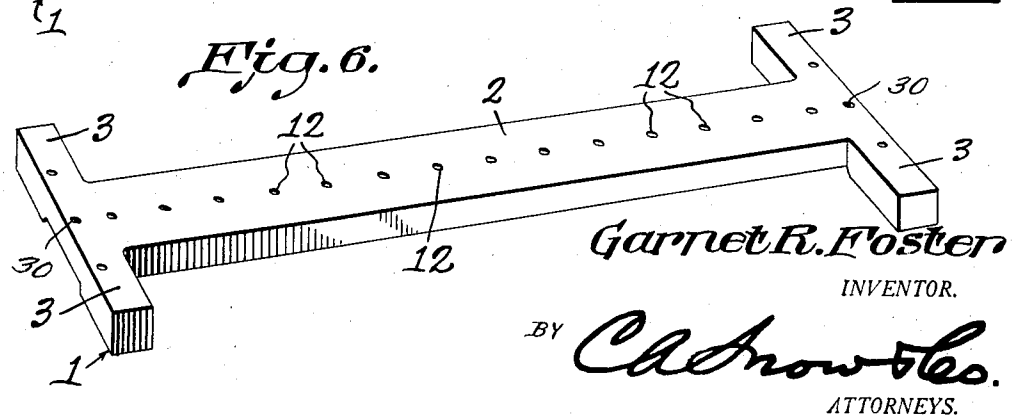


Fig. 6.



Garnet R. Foster

INVENTOR.

BY C. A. Snow & Co.

ATTORNEYS.

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UNITED STATES PATENT OFFICE

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BOWLING ALLEY GAUGE

Garnet R. Foster, Macomb, Ill.

Application July 12, 1937, Serial No. 153,233

1 Claim. (Cl. 33—174)

This invention aims to provide a simple but effective means whereby inequalities in the upper surface of a bowling alley may be made evident, the vertical height of any inequality, or its depression below the upper surface of the bowling alley being gauged.

The invention aims to provide means for indicating the inequalities in the upper surface of a bowling alley, and to provide novel means whereby the device may be mounted on a bowling alley, for sliding movement therealong, and, further, the invention aims to improve and to enhance the utility of devices of that type to which the invention appertains.

With the above and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed, may be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawings:

Fig. 1 shows in elevation, a device constructed in accordance with the invention, parts being broken away;

Fig. 2 is a top plan;

Fig. 3 is a transverse section;

Fig. 4 is a vertical longitudinal section;

Fig. 5 is a horizontal longitudinal section;

Fig. 6 is a perspective showing the base.

In carrying out the invention, there is provided a base 1, which is shown in Fig. 6 of the drawings. The base 1 preferably is an I-beam, including a longitudinal body 2 and transverse skids 3 attached intermediate their ends to the ends of the body. The lower surface of the body 2 is raised slightly, as shown in Figs. 4 and 3 of the drawings, so that a space or opening 4 exists underneath the body 2. The skids 3 support the entire structure on the upper surface of a bowling alley 5, so that the device may be slid along, longitudinally of the bowling alley.

There is provided a casing 6 which may be described, roughly, as being of inverted trough-shape, the casing comprising a convexed front and top 7 provided with horizontally spaced vertical slots 8. The casing 6 is coextensive in length with the base 1, and is provided along its longitudinal edges with outstanding flanges 9, attached by securing elements 10 to the body 2 of the base 1, and to the skids 3.

Inverted U-shaped handles 11 are secured to the skids 3 and extend upwardly over the casing 6. Primarily, the handles 11 are used to slide the device along the bowling alley 5, and to carry the device about, but it is to be observed that the handles, extending over and above the casing 6, also serve to a considerable extent as guards protecting the casing.

As can be seen in Fig. 6, the body 2 of the base 1 has horizontally spaced vertical openings 12 in which tubular guides 14 may be secured if desired. Plungers 15 are mounted for vertical reciprocation in the guides 14 and are provided at their lower ends with enlarged, downwardly convexed feet 16 adapted to ride over the upper surface of the bowling alley 5. The upper ends of the plungers 15 are provided with reduced stems 17, slidable in the upper ends of the guides 14. Where the lower portions of the stems 17 join the plungers proper, shoulders are formed, these shoulders constituting abutments for the lower ends of compression springs 18 surrounding the stems 17, the upper ends of the compression springs abutting against the upper ends of the guides 14, the plungers 15 being forced downwardly by the springs 18, so that the feet 16 of the plungers will make proper contact with the upper surface of the bowling alley 5.

The upper portions of the stems 17 on the plungers 15 extend upwardly into the casing 6, as shown in Fig. 3, and are provided with racks 19. The racks 19 mesh with pinions 20 secured to horizontal shafts 21 journaled in bearing posts 22 secured to the body 2 of the base or I-beam 1. Arms 23 are secured to the shafts 21, on opposite sides of the bearing posts 22 from the pinions 20, as Fig. 5 will show. The arms 23 operate in the vertical slots 8 of the casing 6.

To the forward ends of the arms 23 are secured pointers 24 disposed at right angles to the arms and extended longitudinally of the casing 6 on the outside thereof. Dial plates 25 are secured to the outside of the curved front and top 7 of the casing 6 and have vertical scales 26 reading in opposite directions from a zero point of reference.

A bracket 27 is secured to the forward surface of the body 2 of the base 1, and on the bracket 27 is mounted a level vial 28 which extends lengthwise of the base 1 and transversely of the bowling alley 5.

Adjusting rods 29 are threaded in openings 30 in the ends of the member 2, and are provided with knurled heads 31, a portion of which protrudes through the casing 6.

When the instrument is placed on any cross

section point of a bowling alley and either side is shown by the level **28** to be low, the projecting portion of the heads **31** provide ready manipulation for adjustment of the instrument to a level position for correct reading.

In practical operation, the device is mounted in place on the bowling alley **5**, as shown in Figs. 4 and 1 of the drawings, the lower surfaces of the skids **3** being in contact with the upper surface of the bowling alley. The feet **16** of the plungers **15** are located in the opening **4**, and under impulse of the compression springs **18**, make contact with the upper surface of the bowling alley. As the feet **16** ride over uneven places in the alley **5**, the racks **19** will impart rotation to the shafts **21**, through the instrumentality of the pinions **20**. The pointers **24** will cooperate with the scales **26**, and thus inequalities in the upper surface of the bowling alley may be read off without difficulty, it being possible to ascertain whether the inequalities are elevations or depressions, and it being possible, also, to ascertain, by reference to the scales **26**, the amount of each elevation or depression. The function of the level vial **28** is to indicate when the bowling alley **5** has a transverse slant.

By means of the handles **11**, the device may be advanced slowly along the bowling alley and, thus, inequalities in the upper surface of the alley may be noted and corrected.

The article forming the subject matter of this application is simple in construction, easy to operate and capable of withstanding long continued use without repair.

What is claimed is:

In a device for determining the relative altitude of points on a surface, an elongated body, surface-engaging feelers vertically movable on the body and spaced apart longitudinally of the body, height indicators carried by the body and operatively connected with the feelers, level-indicating means carried by the body, and means carried by the body for bringing the body to a position in which the level-indicating means will show that the body is horizontal, thereby to sesure a true reading on the height indicators as to vertical irregularities in surface conditions.

GARNET R. FOSTER.