F. C. HOBBS.

BOWLING ALLEY PIN SETTER.

APPLICATION FILED MAY 27, 1915.

1,153,917.

Patented Sept. 21, 1915.

4 SHEETS—SHEET 1.

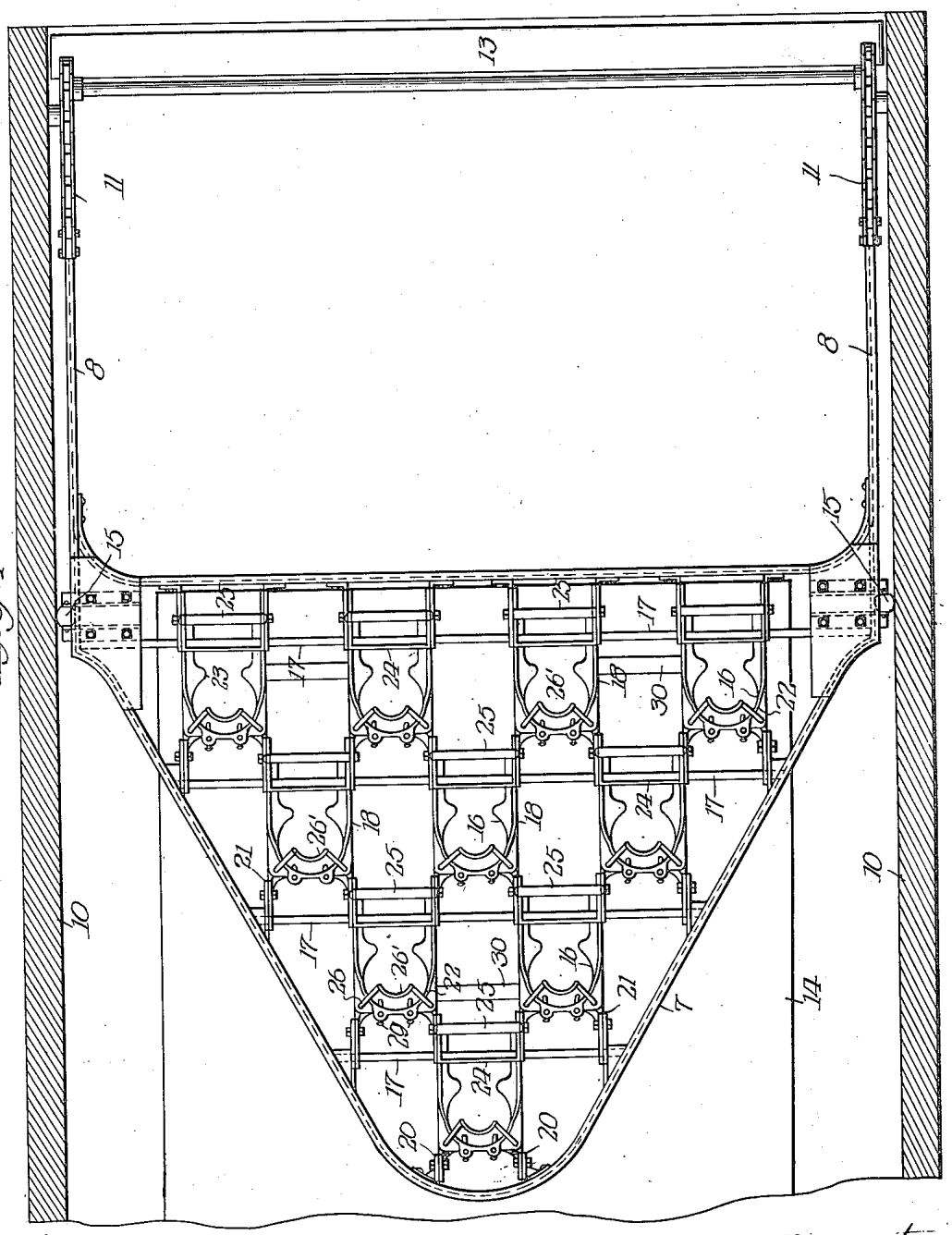


Fig. 1

Witnesses:

S. E. Barratt

M. A. Riddle

Inventor

Frank C. Hobbs

By Wm. L. Ball, Atty.

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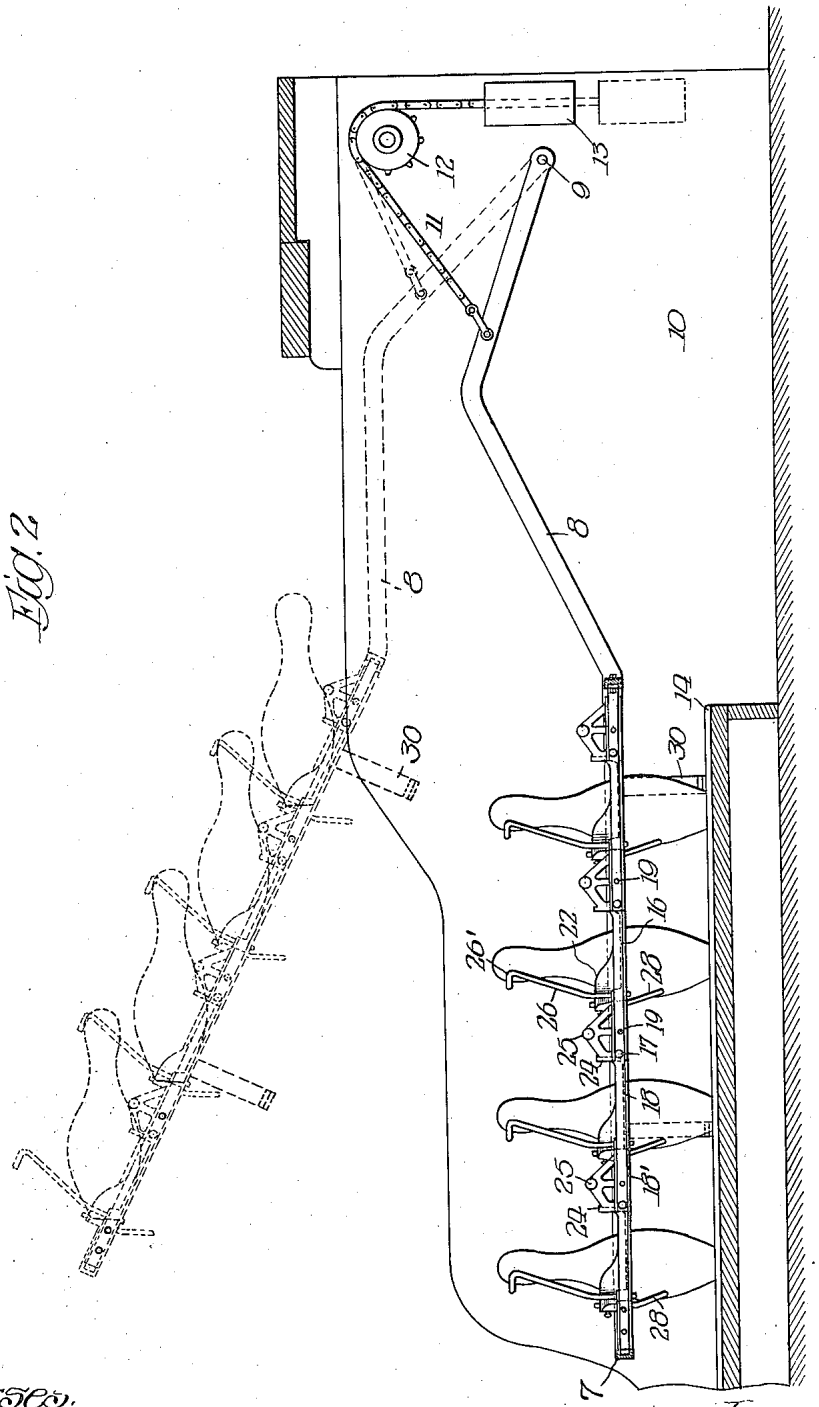


Fig. 2.

Witnesses.

M. A. Riddle

Inventor

Frank C. Hobbs

By Wm. F. Bell Atty.

F. C. HOBBS.

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4 SHEETS—SHEET 3.

Fig. 3

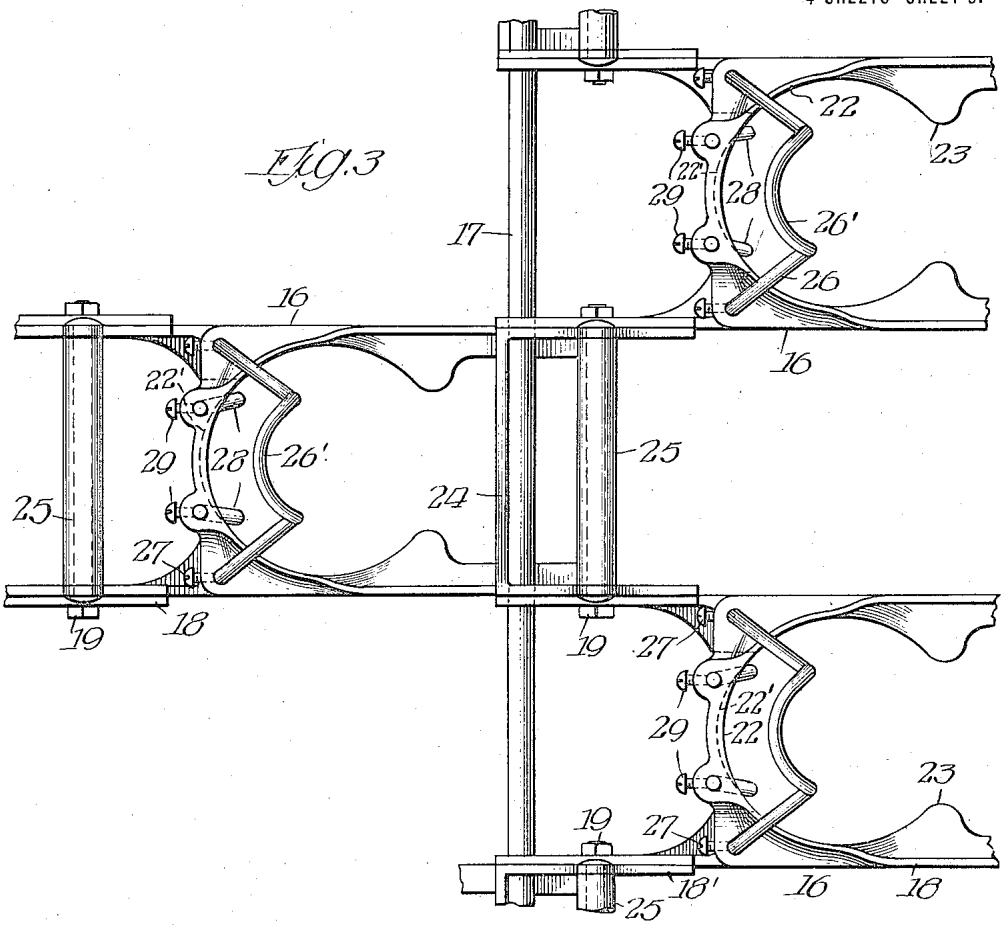
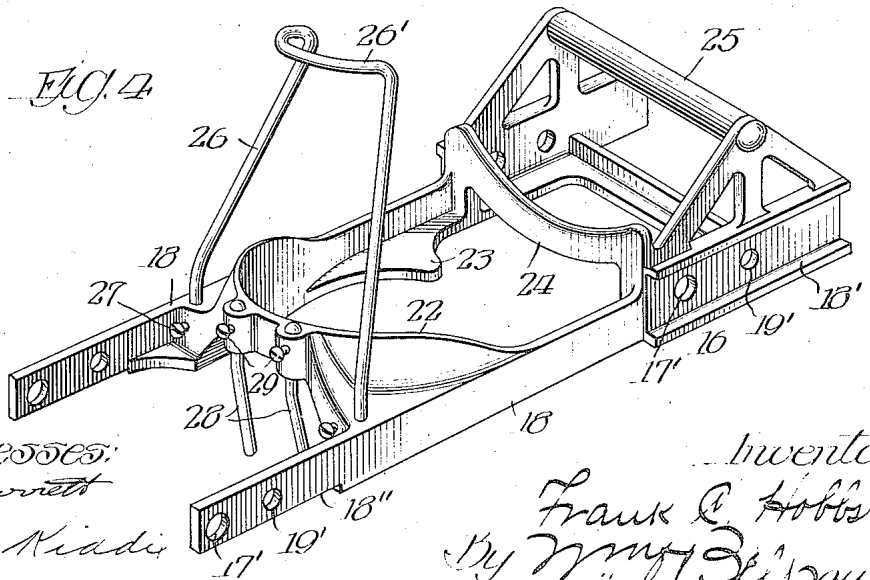



Fig. 4




Witnesses:

A. E. Barrett

M. A. Kiadi

Inventor

Frank C. Hobbs

By Wright Brothers & Mitchell

Attorneys

F. C. HOBBS.

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4 SHEETS—SHEET 4.

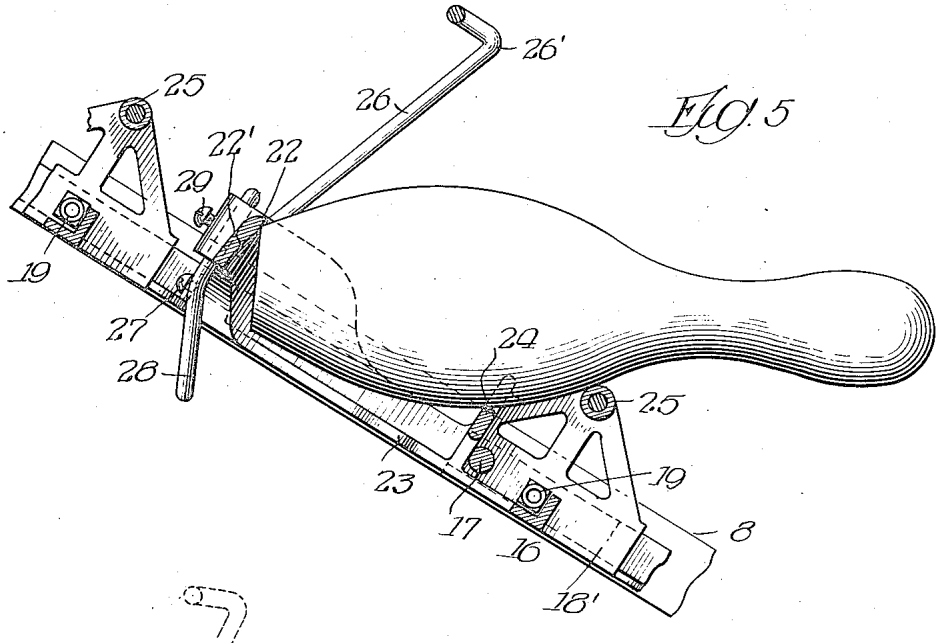


Fig. 5

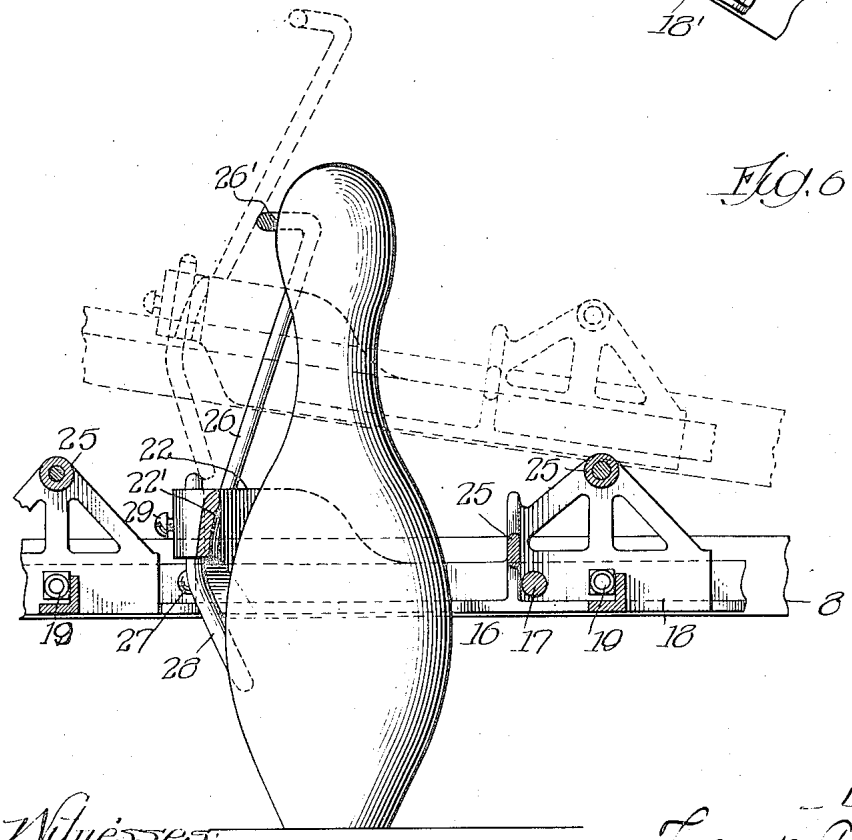


Fig. 6

Witnesses:
M. A. Riddle

Inventor
Frank C. Hobbs
By Wm. V. Reich Atty

# UNITED STATES PATENT OFFICE.

FRANK C. HOBBS, OF MUSKEGON, MICHIGAN, ASSIGNOR TO THE BRUNSWICK-BALKE-COLLENDER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF DELAWARE.

## BOWLING-ALLEY PIN-SETTER.

1,153,917. Specification of Letters Patent. Patented Sept. 21, 1915.

Application filed May 27, 1915. Serial No. 30,780.

*To all whom it may concern:*

Be it known that I, FRANK C. HOBBS, a citizen of the United States, residing at Muskegon, in the county of Muskegon and State of Michigan, have invented new and useful Improvements in Bowling-Alley Pin-Setters, of which the following is a specification.

This invention relates to machines for setting pins on bowling alleys and more particularly to that type of machine which is designed to swing in an arc upon the pin end of the bowling alley as distinguished from that type of machine which travels in a vertical direction.

The object of the invention is to provide a machine of simple and compact construction, comprising but comparatively few parts, which is adapted to receive pins while in an elevated position and to carry them to and position them properly upon the spots on the alley bed.

Another object of the invention is to provide a machine of this character without movable parts but constructed with fixed parts arranged to insure proper positioning of the pins on the spots on the alley bed. And a further object of the invention is to provide a machine consisting largely of standard interchangeable sections adapted to be easily and quickly assembled or taken down as occasion may require and permit of the substitution of a new section in case of damage to any section without changing any of the other sections.

In the accompanying drawings illustrating the preferred embodiment of my invention Figure 1 is a plan view showing my invention on an alley bed with the kick-backs in section; Fig. 2 is a side elevation showing the machine in full lines in setting position on the alley bed and in broken lines in elevated position with portions of the alley in section; Fig. 3 is a detail enlarged plan view showing parts of three sections of the machine; Fig. 4 is an enlarged perspective view of one section of the machine; Figs. 5 and 6 are sectional views of a portion of the machine and a pin in different positions.

Referring to the drawings, the invention comprises a triangular-shaped frame 7, which is made of channel iron, and is provided with rearwardly extending arms 8 pivotally mounted at 9 on the kick-backs 10 of the alley. Chains 11 are attached to these arms and travel over pulleys 12 mounted on the kick-back and carry a counter-balance weight 13. The construction is such that the frame is arranged to travel in an arc above the alley bed 14 and the weight will be proportioned to facilitate the movements of the frame.

Guide rollers 15 are preferably mounted on the frame to engage the kick-backs and guide the frame in its movements. Within this frame I arrange ten pocket sections, each section 16 being separate and independent of the other, without movable parts, and all made of standard construction, exactly alike and interchangeable. These pocket sections are mounted on cross rods 17 suitably secured at their ends to the frame.

I prefer to make each pocket section principally of a single casting comprising the side bars 18, each of which is provided at one end with a channel 18′ to receive the opposite end 18″ of an adjacent section (Figs. 3, 4). These side bars are of sufficient length so that the projecting ends of one will overlap and fit in the channels of the next adjacent section and they are provided with openings 17′ to receive the cross rods 17 and openings 19′ to receive the bolts 19. These rods 17 extend across the frame through two or more pocket sections and support them in the frame while the bolts 19 connect each pocket section with its next adjacent section. The forward end of the king-pin pocket section may be bolted to brackets 20 on the frame, instead of employing a cross rod 17, and short channel brackets 21 are provided on the frame to which the outer pocket sections are bolted, as clearly shown in Fig. 1.

Each pocket section is provided with a pin pocket comprising a curved wall 22 connecting the side bars 18 and integral projections 23 on the side bars, said projections having curved edges conforming substantially to the curvature of said wall to form a circular space somewhat larger than the body of the pin, in which the pin stands in spotted position on the alley bed before the machine moves to elevated position, (Fig. 6). Supporting members 24 and 25 are provided on each pocket frame opposite the wall 22 to cooperate with said wall to support the pin in substantially horizontal position in the pocket when the frame is elevated (Fig. 5). The member 24 is preferably curved between its ends (Fig. 4) to engage the body

of the pin and the member 25 is located above and rearward of the member 24 to engage the shoulder of the pin (Fig. 5). This member 25 may be made in the form of a roller mounted in the frame to facilitate the insertion of the pin in the pocket and relieve whatever jar or shock may be occasioned thereby, or it may consist of a bolt with a rotatable sleeve thereon to answer the same purpose.

A head guide 26 is adjustably secured in the pocket frame by set screws 27 and body guide legs 28 are adjustably secured in the frame by set screws 29. These guides are adjusted in proper position to coöperate with the body guides formed by the projections 23 to properly position the pin on the spot on the alley bed, and for this purpose I have found it desirable to make the top guide in the form of a bent heavy wire curved at the top 26′ to engage the head of the pin, while the body guides 28 are made of separate wires, preferably slightly bent, and properly adjusted to engage the body of the pin on opposite sides of a diametrical line, as indicated in Fig. 6. The guide legs 28 and the projections 23 are arranged substantially at the four corners of a rectangle to engage the body of the pin. These guides are made separate from and are adjustably and rigidly fastened in the pocket frame so that they can be shipped disconnected from the frame to facilitate packing. The guides can be easily arranged in the frame and secured in proper adjusted position by placing the frame on the alley bed resting on the stops 30 and then adjusting and securing the guides in place.

In practice the machine is filled, while in elevated position, the pins being laid or thrown into the pockets in the usual manner and rested in substantially horizontal position upon the transverse supporting members 24, 25 with the upper edge of the base of the pin engaged with the wall 22, (Fig. 5). The construction is such that the pin is supported in this position until the frame is lowered and the stops 30 engage the alley bed, the shock of which engagement is always sufficient to cause the base of the pin to slide down the wall 22. To facilitate this sliding movement of the pin I may bevel or incline the wall 22 at 22′, below the point of initial engagement of the pin therewith. When the frame strikes the alley bed the pins swing from horizontal to vertical position upon the spots on the alley bed and they are positioned upon the spots by the head, body and bottom guides. These guides are so located and arranged that they will clear the pins when the frame is elevated without disturbing them from their spotted position on the alley bed.

The invention is simple in construction and comprises but comparatively few parts, which, as before noted, are all fixed and do not move except as an integral part of the machine. I thereby avoid the wear and liability to get out of adjustment incident to movable parts in a machine of this character and accomplish the setting operation in a simple manner.

I claim:

1. In a pin-setter for bowling alleys, the combinaion of a frame and a plurality of pin pockets, each of said pockets having fixed guides to engage the pin at different points lenghtwise thereof to position the pin on the alley bed.

2. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pin pockets, each of said pockets having fixed guides to engage the body of the pin at different points lengthwise thereof to position the pin on the alley bed.

3. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pin pockets, each of said pockets having fixed guides to engage the pin at different points lengthwise and peripherally thereof to position the pin on the alley bed.

4. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pin pockets, each of said pockets having an upwardly projecting fixed guide to engage the upper portion of the pin and assist in positioning the pin upon the alley bed.

5. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pin pockets, each of said pockets having a downwardly extending fixed guide to engage the pin.

6. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pin pockets, each of said pockets having upwardly and downwardly extending fixed guides to engage the pin.

7. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pin pockets, each of said pockets having upwardly and downwardly extending fixed guides and additional oppositely disposed fixed guides to engage the pin.

8. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pin pockets, each of said pockets having four independent guides to engage the body of the pin peripherally.

9. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pin pockets, each of said pockets having an upwardly extending fixed guide to engage the head of the pin, downwardly extending fixed guides to engage the body of the pin and oppositely disposed intermediate fixed guides to engage the body of the pin.

10. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pin pockets, each of said pockets comprising a pair of downwardly disposed independ-

ent fixed guide legs to engage the body of the pin.

11. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pocket sections supported therein, each section comprising a pair of side bars having channels at one end to receive the opposite ends of adjacent sections.

12. In a pin-setter for bowling alleys, the combination of a frame, a plurality of cross rods, and a plurality of pocket sections constructed to interfit and mounted on said cross rods.

13. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pocket sections, each of said sections comprising in one piece a pair of side bars, a curved connecting wall and transverse pin-supporting members.

14. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pocket sections, each of said sections comprising in one piece a pair of side bars, a curved connecting wall, body guides, and transverse pin-supporting members.

15. In a pin-setter for bowling alleys, the combination of a frame and a plurality of pocket sections, each of said sections comprising in one piece a pair of side bars, a curved connecting wall, body guides, and transverse pin-supporting members, and detachably secured head and body guides on said piece.

16. In a pin-setter for bowling alleys, the combination of a pivotally mounted frame, a plurality of pin pockets in the frame, each comprising relatively immovable parts adapted to frictionally support the pin when the machine is in elevated position and permit the automatic discharge of the pin when the machine engages the alley bed.

17. In a pin-setter for bowling alleys, the combination of a pivotally mounted frame, a plurality of pin pockets therein, each comprising relatively immovable parts adapted to frictionally support a pin when the machine is in elevated position and permit the automatic discharge of the pin when the machine engages the alley bed, and other immovable parts to position the pin on the alley bed.

FRANK C. HOBBS.

Witnesses:
WM. L. REITZ, Jr.,
H. C. CARPENTER.