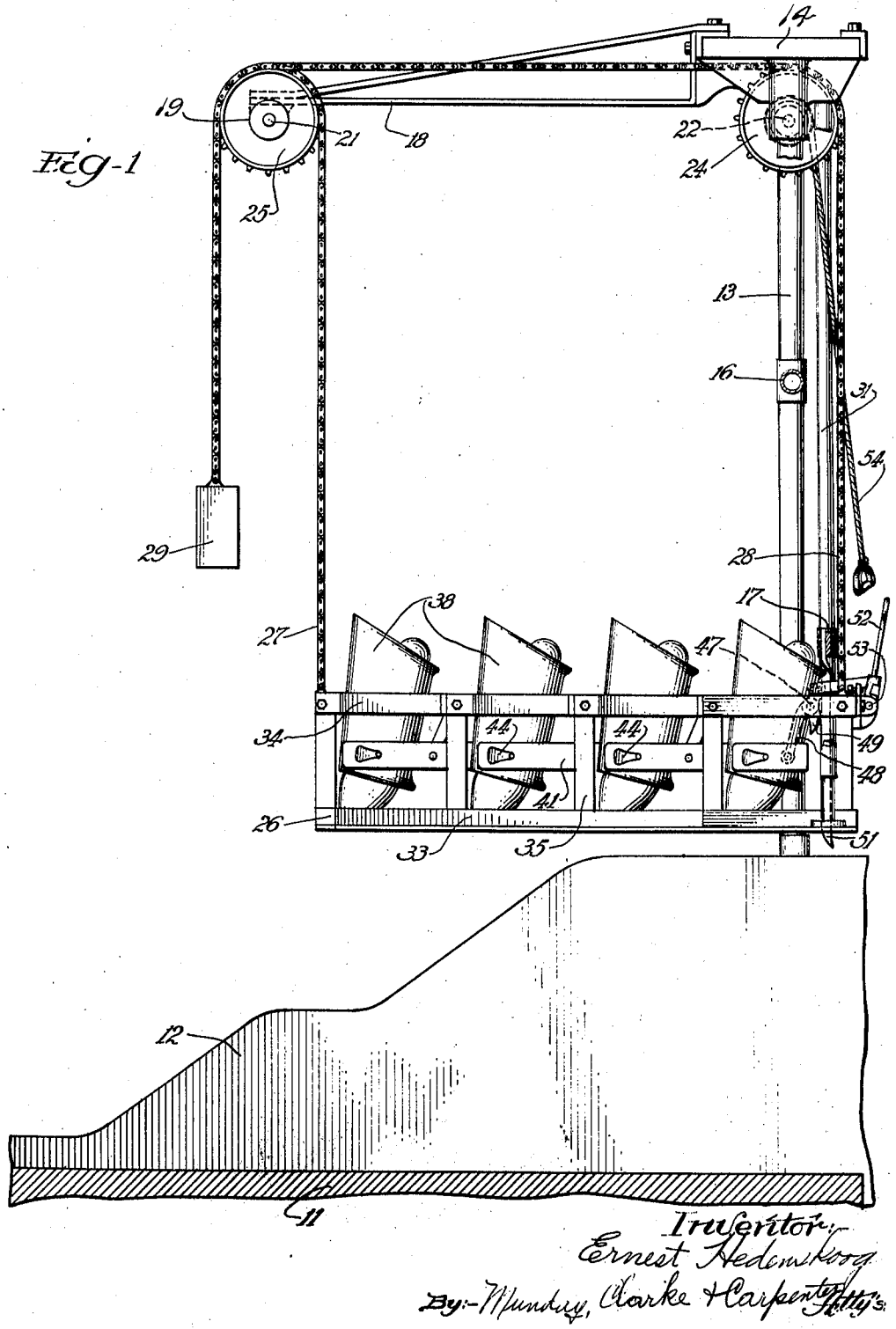
Aug. 31, 1926. 1,597,973

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PIN SPOTTER

Filed April 23, 1924 5 Sheets-Sheet 1

Fig-1



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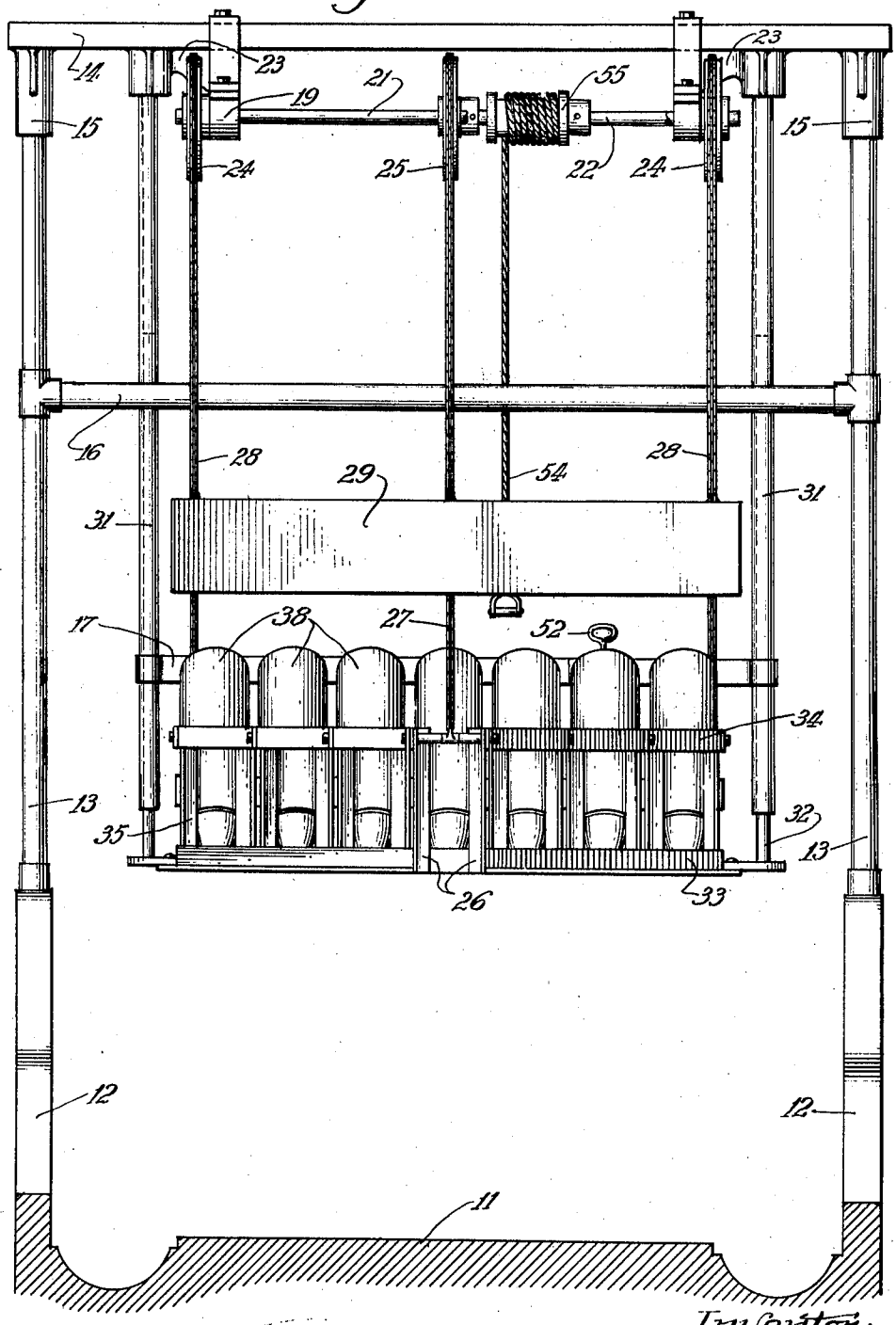
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Fig-2



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PIN SPOTTER

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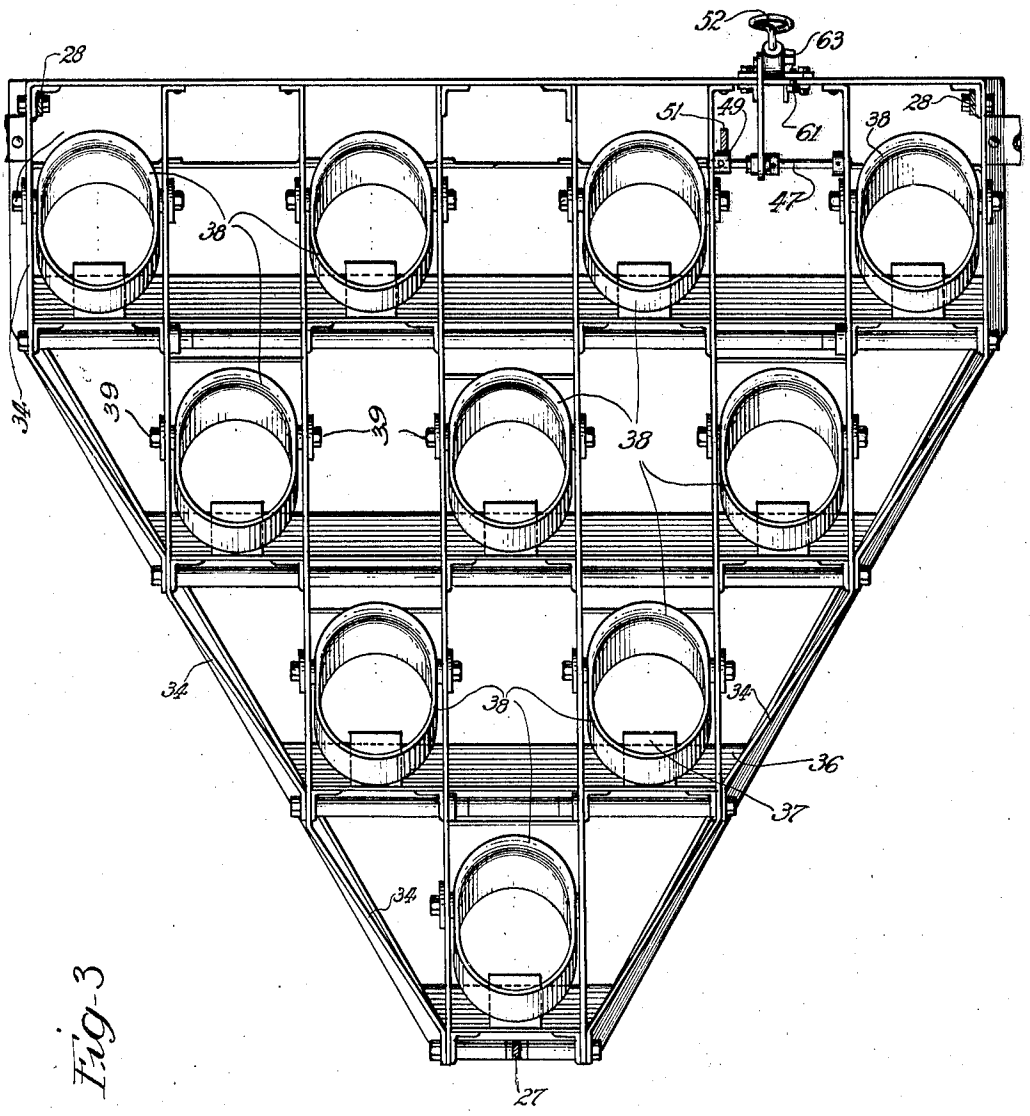


Fig-3

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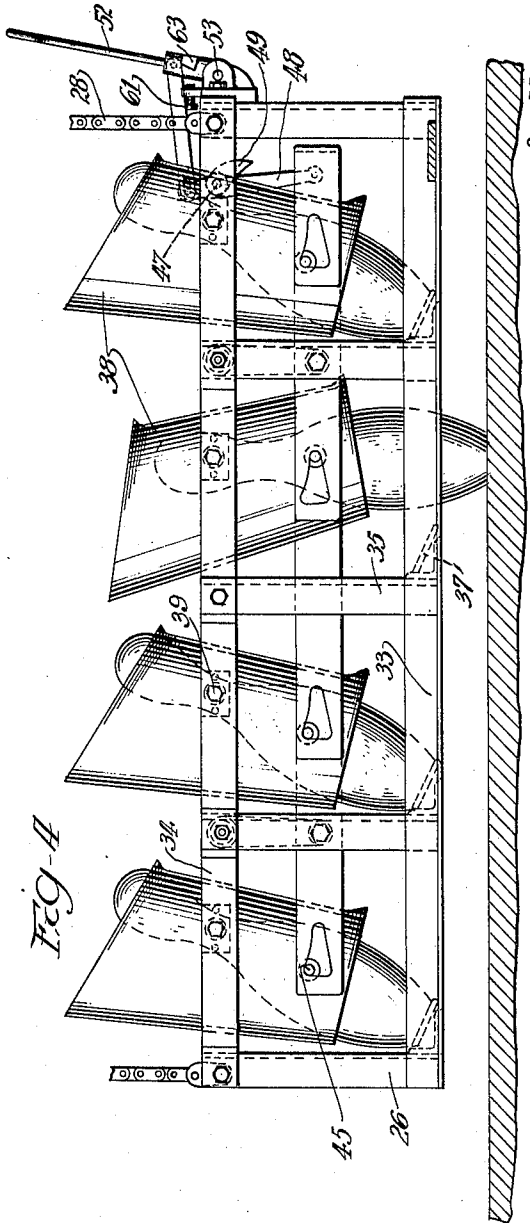


Fig-4

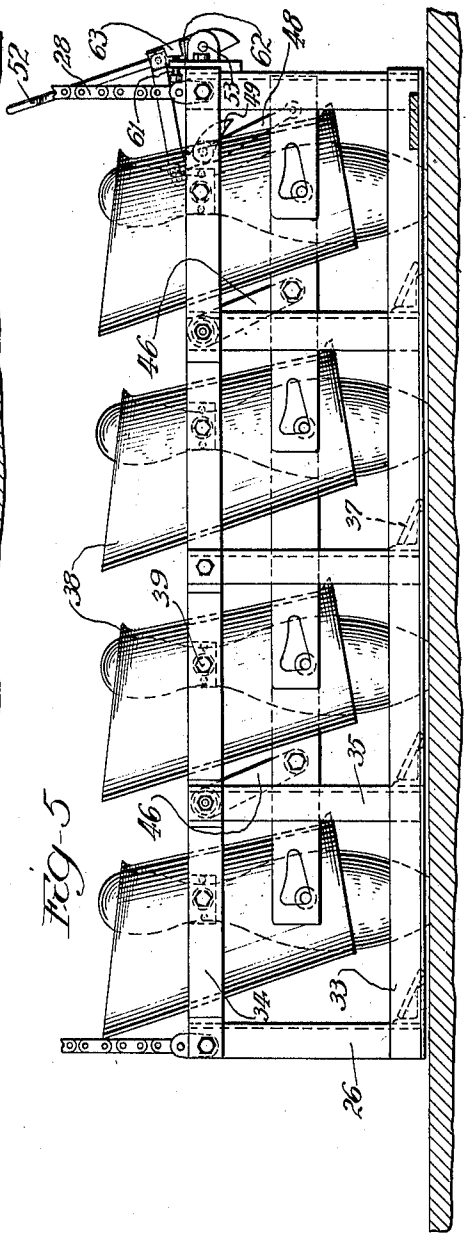


Fig-5

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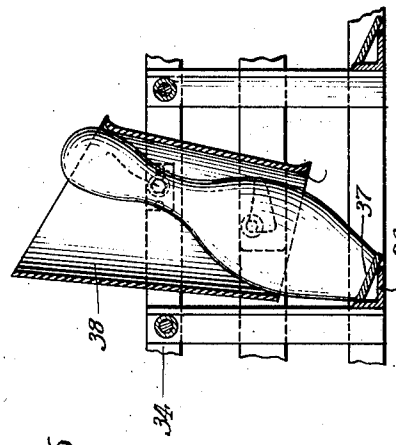


Fig-6

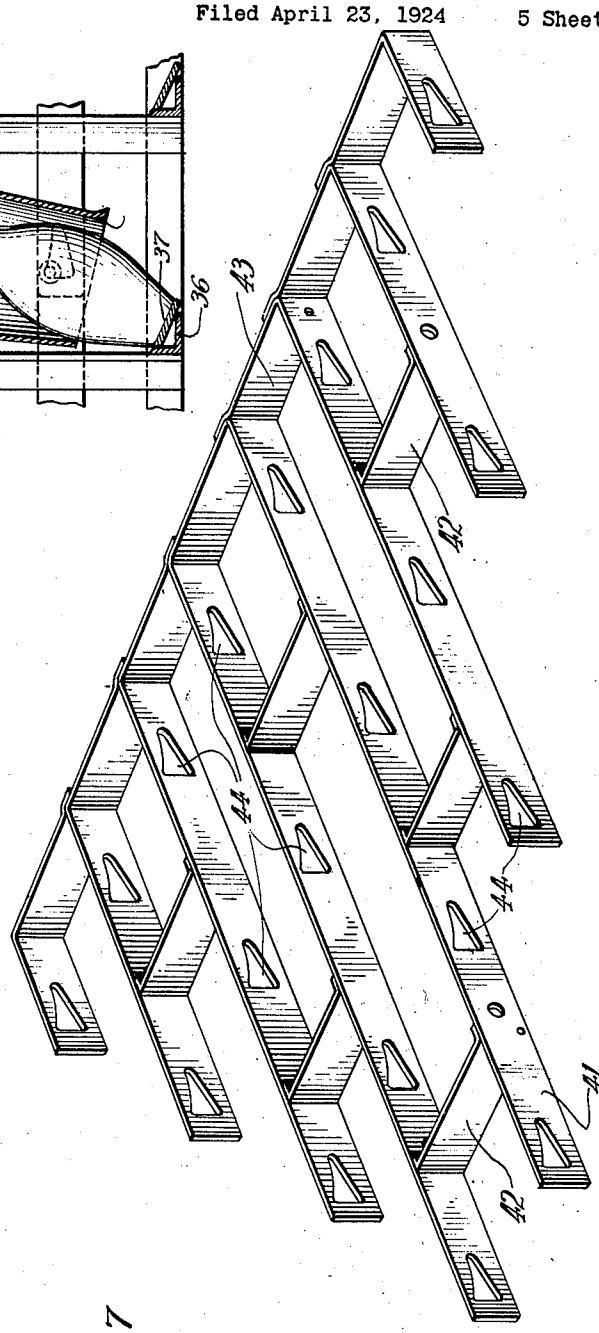


Fig-7

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UNITED STATES PATENT OFFICE.

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PIN SPOTTER.

Application filed April 23, 1924. Serial No. 708,441.

This invention relates in general to pin setting machines for bowling alleys, i. e. machines adapted to place the pin in playing position upon the alley bed.

A principal object of the invention is the provision of a pin setting machine, which will not require that pins left standing after the player has finished his bowling, be removed and replaced in the setter as a preliminary to the next setting operation. It not infrequently happens that less than all of the pins are knocked down in the play and in the past it has been necessary in every resetting operation for the attendant to take from the alley all of the standing pins and place them, along with those that have been bowled over, into the pin setter. This removal of the standing pins has been necessary in order that the setting action of the pin setter might not be interfered with. In eliminating this action which has heretofore been necessary, not only is the physical effort of re-setting the pins reduced but the time required in the re-setting operation is frequently materially shortened.

Another important object of the invention is the provision of a pin setting machine, which will be readily adjustable for accurate setting. Occasionally as the pins wear they are sometimes turned to a slightly smaller diameter and my present invention contemplates that worn pins, either re-turned or not, will be accurately set upon the spots.

A further and highly important invention is the provision of a pin setting machine adapted particularly for manual operation by the attendant, of new and improved construction and more easily operated in the setting action than has usually been the circumstance.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

On the drawings,

Figure 1 is a side elevation of a pin setting machine embodying my present invention;

Fig. 2 is a front view thereof;

Fig. 3 is a top plan view of the setter frame and parts carried by it;

Figs. 4 and 5 are side elevations showing different steps in the pin setting action;

Fig. 6 is a fragmentary section taken through a pin pocket; and

Fig. 7 is a perspective view of the control frame.

For the purpose of illustrating my invention I have shown on the drawing only so much of the bowling alley as seems necessary to an understanding thereof. 11 indicates the alley bed and 12 the side walls of the alley. Two uprights 13 are mounted upon the two side walls 12 and these are connected across their tops by an overhead support or connection 14 having socket members 15 into which the tops of the posts 13 extend. A cross member 16 is connected to the posts below the top thereof. Two forwardly extending arms 18 are arranged on the overhead support 14 and these carry bearings 19 for a shaft 21. A second shaft 22 is mounted in bearing brackets 23 extending down from the underside of the support 14. Two sprocket wheels 24 are provided upon shaft 22 and three such sprocket wheels 25 are arranged upon shaft 21. The setter frame, indicated generally by 26, is supported from three sprocket chains 27 and 28, there being two chains 28. The chains 28 are fixed to the two rear corners of the setter frame and extend up over the sprocket wheels 24 on the shaft 22 and over the two end sprocket wheels 25 to a counterweight 29. The chain 27 is secured to the front end of the frame and extends up from the center, sprocket wheel 25 to such counterweight 29. Two tubes 31 connected by cross bar 17 extend down from the overhead support 14 into sliding engagement with two guide rods 32 at the rear of the setter frame for guiding the pin setter in its setting movement. The setter frame is of triangular plan and consists of a lower frame section 33 and an upper frame section 34 connected at intervals by upright connecters 35, all rigidly secured together. Cross members 36 are arranged in the lower frame section and these carry pin bottom supports 37 arranged in accordance with the spots on the alley bed but out of registration therewith and in front of the same.

A plurality of pin pockets 38 are pivotally mounted in the upper frame section 34, the number and arrangement of course corre-

sponding with the number and arrangement of the pins to be set. Each of these pockets has a slightly flaring mouth and each is supported pivotally at 39, the pivot support being such that the pockets, unconstrained, assume positions permitting pins standing upon the alley to pass into them when the frame is lowered and the pocket empty. The pivotal connection of each pocket is arranged with respect to the companion pin supported so that the pins rest in the pockets in the inclined position shown at the ends of Fig. 4. The pins when so resting in the pockets hold them against movement to the position shown in Fig. 5 until the actual setting operation occurs, as will be later explained.

A control frame, shown in detail in Fig. 7, is provided to swing the pockets to pin receiving position when the setter frame is at the top of its stroke and to move the pins to setter position when the frame is at the bottom. The action of this control frame will be described in detail presently.

A plurality of bars 41 are arranged to extend longitudinally of the alley and are connected by cross-members 42 and are connected together by bent legs 43 at the back. These bars are provided with companion slots 44 to receive studs 45 extending out from near the bottom of the pin pockets. The control frame is supported in position by links 46 appropriately arranged to extend down from the upper pin setter frame section 34. A lever pivoted at 47 in the upper frame section 34 has one arm 48 connected with the control frame, and a second arm 49 formed for engagement by a cam pin 51. When the setter frame is moved to its upper or pin receiving position the arm 49 engages a cam pin 51, which is carried by the cross member 17 and the control frame is thrust toward the front of the alley. In this action the studs 45 are engaged with the front ends of the slots 44 and all of the pin pockets are tilted to present the top or open mouths thereof toward the attendant and the pockets are thus arranged so that pins deposited in them will rest upon the pin supports. A hand lever or manipulative device 52 is pivoted at 53 in the frame in position to be pressed upon by the attendant in lowering the frame and a cord or rope 54 wound upon a drum 55 on shaft 21 is pulled by the operator to aid in lowering the frame against the counterweight 29.

As the setter frame descends, the surfaces of the arm 49 and the cam rod 51 disengage and the control frame moves by gravity to the position shown in Fig. 4. This leaves the pockets free momentarily of the control of the frame except that empty pockets are prevented from swinging past the standing pin receiving position. When the pin setter frame has arrived upon the alley bed the attendant pushes forward on the lever 52 swinging the control frame to the position shown in Fig. 5, bringing all of the pockets to upright position and swinging the pins from the inclined position to a vertical one with the pins resting upon the spots. The bottoms of the pins are slid off the supports and along the alley until they are in accurate registration with the spots. The curved interior faces of the pockets are of larger radius than the radius of the pin part engaged thereby and in this manner centering is accomplished. As the frame descends, standing pins are freely embraced by the pocket without interference with the action.

A set screw 61 is positioned through a bracket 62 in position to engage a lug 63 on the lever 52 to limit and determine the backward sliding movement of the pins. Adjustment of this set screw 61 insures accurate registration of the pins with the spots and as the pins are made slightly smaller in diameter this readjustment provides adequate compensation. When the pin setter frame is freed of its charge of pins, it rises under the counterweight when the attendant grasps the manipulative handle. The arrangement of the hand lever 32 is such that action by the attendant is the natural one now employed in setting the pins where such lever or handle is not provided. With the pin setter frames prior to my invention I have noticed that when the attendant grasps the handle upon the rope to pull down he also rests his other hand upon the frame, pushing down with it to supplement the pulling action upon the rope.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a pin setting machine for a bowling alley, a setter frame having a plurality of pivoted pockets adapted to receive the pins for depositing upon the alley bed and in accordance with the arrangement of the spots thereon, said frame being adapted to move down into setting position passing over a pin standing on a spot on the alley bed.

2. In a pin setting machine for a bowling alley, the combination of a frame movable vertically toward and from the alley bed, and a plurality of pivoted pockets carried by said frame and adapted to receive the pins when the frame is in upper position, said pockets passing over pins left standing on the spots on the alley bed when the frame descends.

3. In a pin setting machine for a bowling alley, the combination of a frame movable vertically toward and from the alley bed, and a plurality of pivoted pockets carried by said frame and adapted to receive the pins when the frame is in upper position, said pockets passing over pins left standing on or adjacent the spots on the alley bed when the frame descends and serving to center said standing pins accurately on the spots.

4. In a pin setting machine for a bowling alley, the combination of a setter frame, a plurality of pockets pivotally mounted in said frame, supports in said frame for the bottoms of pins carried in said pockets, and means for swinging said pockets about their pivots when the frame reaches the alley bed to slide the pins off the supports and onto the spots of the alley.

5. In a pin setting machine for a bowling alley, the combination of a setter frame, a plurality of pivoted pockets arranged in said frame to receive the pins, supports for the pins located below said pockets and arranged out of registration with the spots on the alley bed, unoccupied pockets being capable of swinging by gravity into registration with the spots on the alley bed to permit reception of pins standing thereon.

6. In a pin setting machine for a bowling alley, the combination of a setter frame, a plurality of pivoted pin receiving devices therein, means for holding said devices in inclined relation prior to the setting operation and means for releasing said holding means, said devices when unoccupied being capable of swinging by gravity during the setting operation to a position permitting their passage over pins standing on the alley.

7. In a pin setting machine for a bowling alley, the combination of a vertically movable setter frame, a plurality of pivoted pin receiving devices therein, mechanism for causing conjoint movement of said devices to spot the pins on the alley bed, and connections between said devices and said mechanism permitting said devices to assume predetermined positions intermediate said ends of the movement.

8. In a pin setting machine for a bowling alley, the combination of a vertically movable setter frame and pin setting devices pivotally mounted in said frame, said devices being individually held in a predetermined position by a pin carried thereby.

9. In a pin setting machine for a bowling alley, the combination of a vertically movable setter frame, pin setting devices mounted in said frame, said devices being individually held in a predetermined position by a pin carried thereby, and means for moving conjointly all of said devices occupied by pins when said setter frame arrives at pin setting position.

10. In a pin setting machine for a bowling alley, the combination of a vertically movable frame for receiving a set of pins and for setting them upon the spots of the alley bed, said frame comprising means for supporting the pins in inclined position and means for engaging pins in a plane extending lengthwise of the alley, and means for operating the engaged pins to swing the pins bodily off said supporting means and into position upon the said spots.

11. In a pin setting machine for a bowling alley, a movable pin setter frame, pockets movably mounted in said frame for receiving the pins in inclined position, supports below the pockets to be engaged by the pin bottom when so held, and means for righting the pins and sliding them off said supports and onto the spots of the alley bed.

12. In a pin setting machine for a bowling alley, a movable pin setter frame, pin receiving pockets mounted for both individual and conjoint movement, and a pin pocket control frame mounted in the setter frame and assuming different positions as incident to the reception of the pins in the setter frame, the travel to the alley bed, and the setting of the pins thereon.

13. In a pin setting machine for a bowling alley, a movable pin setter frame, pivoted pockets carried therein for receiving the pins, a control frame for the pockets, and means for moving said control frame to bring the pins into accurate setting position upon the spots of the alley bed.

14. In a pin setting machine for a bowling alley, a movable setter frame, a plurality of pin pockets pivotally mounted in the frame, means for shifting said pockets to position to receive the pins, means for supporting the pins in the pockets, and means for shifting the pockets to dislodge the pins from said supports and spot the pins on the bowling alley bed.

15. In a pin setting machine for a bowling alley, a setter frame, a plurality of pin pockets pivotally mounted in the frame nearer to the top than to the bottom of the pockets, means for supporting pins in said pockets, and means connected with the pockets below their pivots for swinging the pockets to dislodge the pins from their supports and spot them on the alley bed.

16. In a pin setting machine for a bowling alley, a movable setter frame, a plurality of pin pockets pivotally mounted in the frame, means located below each pocket and in front of the pivot for the pocket for supporting pins in the pockets, and means for shifting the pockets to dislodge the pins from said supports and spot them on the alley bed.

17. In a pin setting machine for a bowling alley, a movable setter frame, a plurality of pin pockets pivotally mounted in

the frame, the pivot for each pocket being located nearer the top than the bottom and nearer the rear than the front of the pocket, means for supporting the pins in the pockets, said means being located below the pockets and in front of the pivots therefor, and means connected with the pockets for shifting the pockets to dislodge the pins from said supports and spot them on the alley bed.

18. In a pin setting machine for a bowling alley, a movable setter frame, a plurality of tubular pin pockets pivotally mounted in the frame, means for positioning said pockets with their upper ends inclined rearwardly to receive the pins, means located below the pockets and in front of the pivots of the pockets for supporting pins in inclined position in the pockets, and means connected with the pockets for swinging them on their pivots to dislodge the pins from said supports and spot them on the alley bed.

19. In a pin setting machine for a bowling alley, a movable setter frame, a plurality of pin pockets pivotally mounted in said frame, said pin pockets being movable conjointly and independently, means for supporting pins in the pockets, and means for swinging the pockets to dislodge the pins from said supports and to spot them on the alley bed.

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