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BOWLING ALLEY

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3 Sheets-Sheet 1



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Fig. 4.

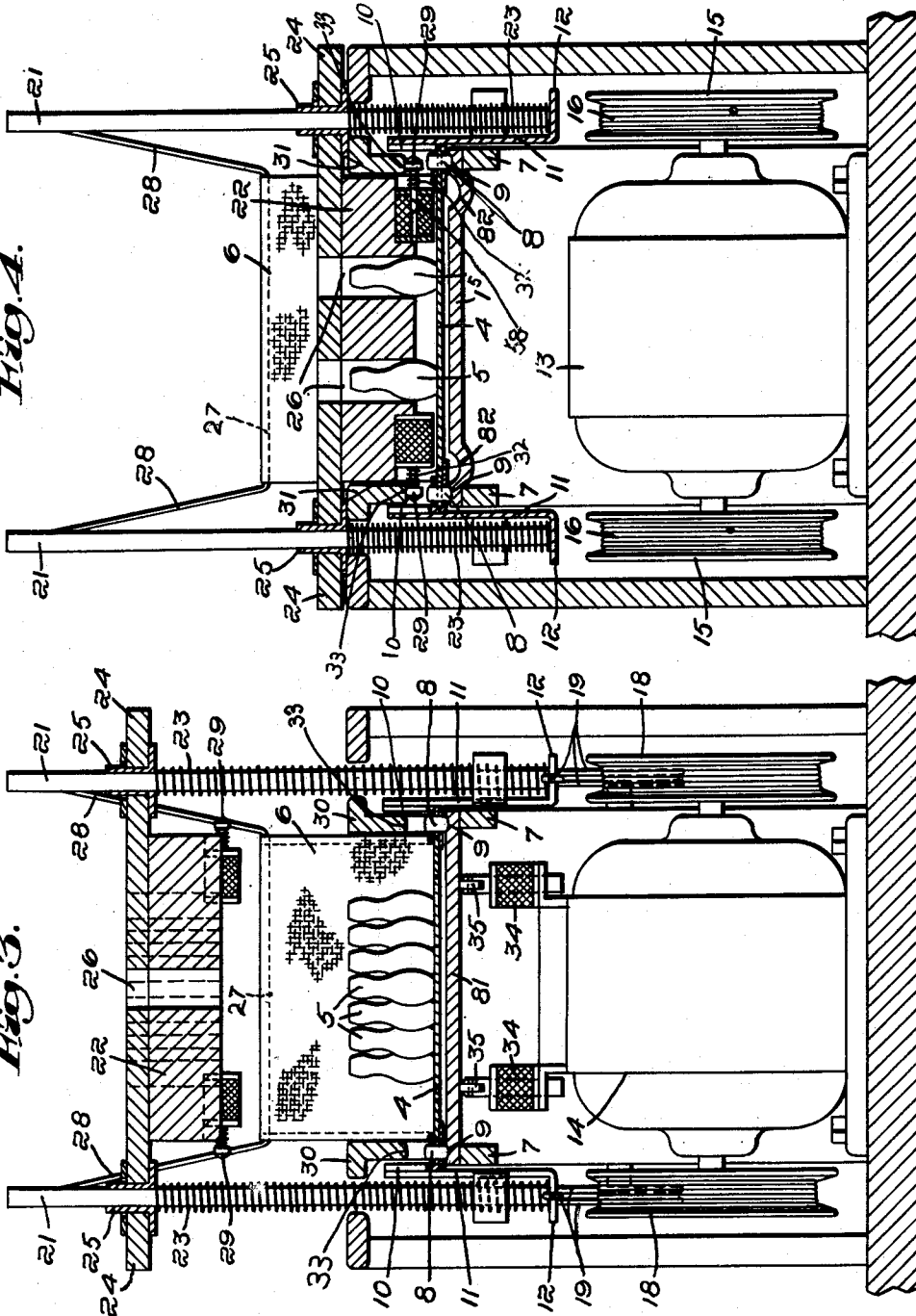


Fig. 3.

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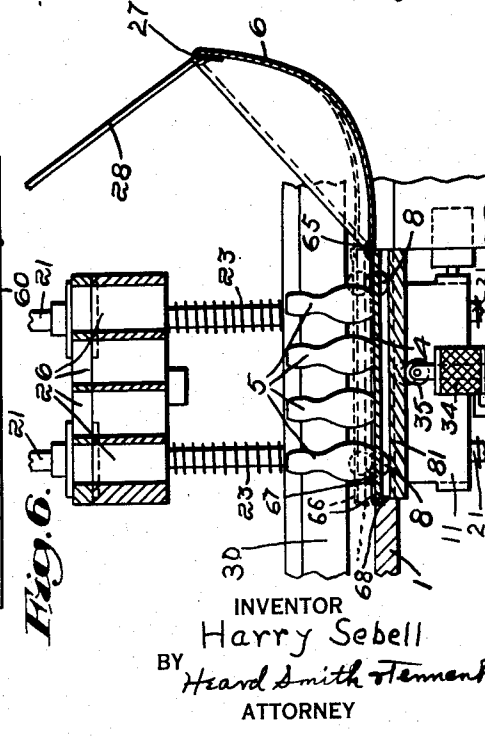
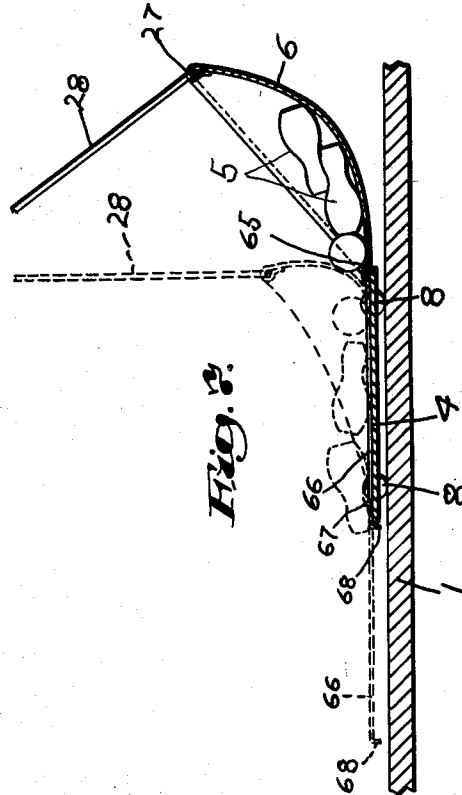
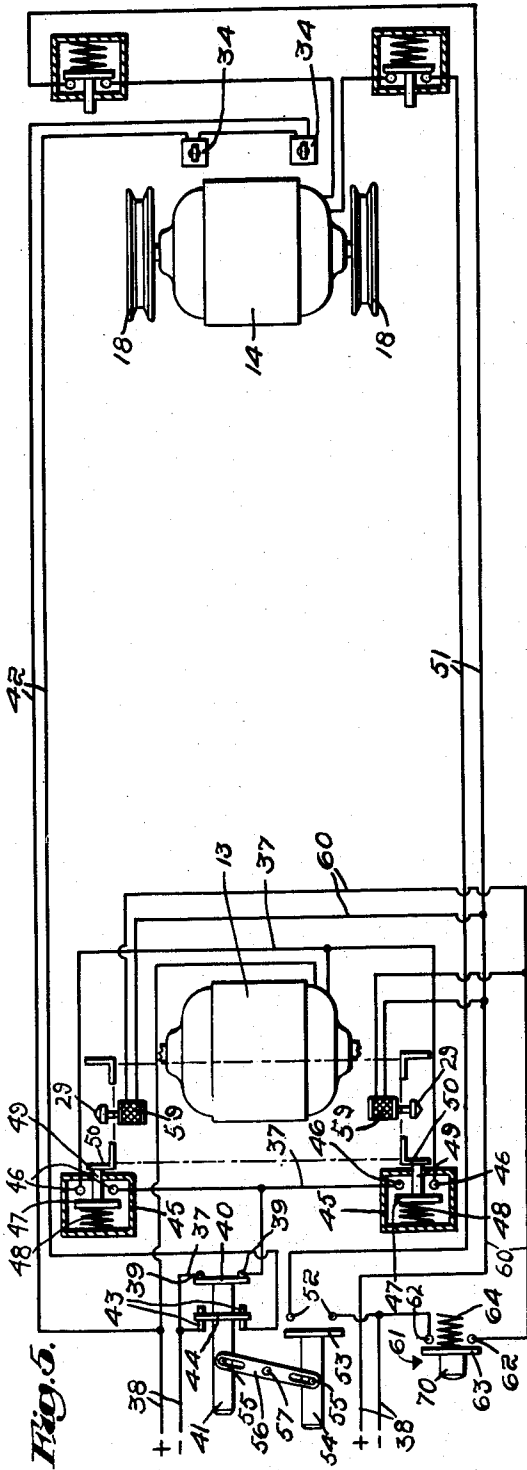
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3 Sheets-Sheet 3



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BOWLING ALLEY

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8 Claims. (Cl. 273-43)

This invention relates to bowling alleys and particularly to the means for setting up the pins.

One of the objects of the invention is to provide a novel bowling alley which is constructed so that the player can set up his own pins without leaving the end of the alley from which he rolls the balls, thus obviating the necessity of employing pin boys for this purpose.

Another object of the invention is to provide a novel bowling alley construction which is provided with means for transporting the balls which have been rolled and the pins, whether they have been knocked down or are still standing, from the end of the alley on which the pins are set up to the opposite end of the alley from which the player rolls his balls, and which for convenience will be referred to as the "playing end," so that the player can set up his own pins.

A further object of the invention is to provide novel means for transporting the set-up pins from the playing end of the alley back to the opposite or pit end.

Still a further object of the invention is to provide means for retaining the set-up pins in their upright position during their return journey from the playing end of the alley to the opposite end.

Further objects of the invention are to provide various other novel features relating to bowling alleys which will be more fully hereinafter set forth.

This invention, therefore, provides means whereby after a player has rolled the prescribed number of balls, he can operate mechanism which will transport the pins and the balls the length of the alley to the playing end thereof so that the pins may be re-set by the player without leaving his position at the playing end.

The invention also provides means whereby when the pins have thus been set up they are transported to the opposite end of the alley in an upright position and are then properly set up for the next play.

In order to give an understanding of the invention, I have illustrated in the drawings a selected embodiment thereof, which will now be described, after which the novel features will be pointed out in the appended claims.

Referring to the drawings,

Fig. 1 is a top plan view of a bowling alley embodying the present invention.

Fig. 2 is a side view with parts shown in section.

Fig. 3 is an enlarged section on the line 3-3, Fig. 2.

Fig. 4 is a transverse section on the line 4-4, Fig. 1 showing the pin-supporting platform at the playing end of the alley and illustrating the pin-retaining member in its operative position.

Fig. 5 is a wiring diagram by which the operative mechanism is controlled.

Fig. 6 is a fragmentary sectional view on the line 6-6, Fig. 1.

Fig. 7 is a fragmentary sectional view taken through the pin-supporting platform.

In the drawings 1 indicates the bed or floor of the alley over which the balls are rolled, said alley having a floor space 2 at one end where the player stands for rolling the balls and being provided with the usual foul line 3, and also with the usual gutters 82.

My improved alley is provided with a pin-supporting platform 4 on which the pins 5 are set up. This platform 4 is adapted for traveling movement from one end to the other of the alley, and is shown as wide enough to extend over the gutters.

Associated with the pin-supporting platform 4 is a basket or carrier 6 adapted to receive the pins which are knocked down and also to receive the balls which have been rolled, said basket or carrier 6 taking the place of the usual pit in a standard bowling alley. The basket or carrier 6 may be made in various ways without departing from the invention, but I have illustrated it as made of fabric and as being attached to the pin-supporting platform 4 and situated in the rear thereof so that any pins which are knocked down and the balls which have been rolled will be collected in the basket or carrier.

Means are provided whereby after any player has rolled the required number of balls, the pin-supporting platform 4 together with the carrier 6 and the pins and balls which have been collected therein may be transported from the right hand end of the alleyway in Figs. 1 and 2 to the left hand end from which the player rolls the balls. After the pin-supporting platform and the carrier have thus been transported to the playing end of the alley, the player may set the pins up on the platform. Means are also provided by which the platform with the pins set up thereon may then be transported lengthwise of the alley back to its operative position shown in Fig. 2, thereby placing the pins in position for the play.

The invention also includes means for retaining the pins in their upright position during the return journey of the platform.

When the pin-supporting platform 4 is in its operative position at the back end of the alley,

the upper surface of the platform is flush with the top surface of the bed 1 shown in Fig. 6 and said platform rests on and is supported by a suitable support 81. When the platform and carrier 6 are to be transported from their operative position shown in Fig. 2 to the playing end of the alley, the platform is first raised slightly to lift it above the upper surface of the bed 1 and then said platform is moved forwardly over the surface of the bed, said platform being provided with rollers 8 which travel on tracks 9 situated outside of the gutters 82.

Any suitable means may be employed for giving the pin-supporting platform 4 and the carrier 6 their traveling movement from one end to the other of the alley and for raising the platform preparatory to its forward journey. In the construction herein shown the pin-supporting platform is formed at each side with an upstanding wall 10, and each wall 10 has two depending brackets 11 secured thereto, the lower end of said brackets being situated considerably below the platform 4 and the lower end of each bracket having a laterally extending portion 12. There is herein shown two motors 13, 14 for giving the platform 4 its traveling movement, one motor, the motor 13, being operative to move the platform from its operative position shown in Fig. 2 forwardly to the playing end of the alley and the other motor 14 being operative to give the platform its return movement from the playing end of the alley to its operative position. The motor 13 has mounted on its shaft two pulleys 15, one on either side of the motor, and attached to each pulley is a flexible connection 16 which extends around a direction pulley 17 and is secured to one of the lateral extensions 12. The other motor 14 also has two pulleys 18 fast on its shaft, one either side of the motor, and each pulley 18 has a flexible connection 19 secured thereto which passes around a direction pulley 20 and is secured to another of the lateral projections 12.

Assuming the parts are in the position shown in Fig. 2, it will be observed that if the motor 13 is operated to turn the pulleys 15 associated therewith in a counterclockwise direction, the two flexible connections 16 will be wound up on the pulleys and the pin-supporting platform will be moved from the right hand end of the alley to the playing end thereof. During this movement the connections 19 will be unwound from the pulleys 18. The means for operating the motors 13 and 14, which will be presently described, are such that when the circuit of the motor 13 is closed to render said motor operative, the circuit of the motor 14 will be opened so that the rotor of the motor will be free to rotate backwardly as the flexible connections 19 are unwound from the pulleys 18. Similarly, when the circuit for the motor 14 is closed to operate said motor the circuit of the motor 13 will be opened so that as the motor 14 is operated to wind up the flexible connections 19 on the pulleys 18, the rotor of the motor 13 will be free to rotate backwardly to allow the connection 16 to be unwound from the pulleys 15.

Each of the lateral projections 12 carries an upstanding post 21 which rises considerably above the bed 1 of the alley. These posts support a pin-positioning block 22 which is capable of vertical movement on the posts. Said block 22 is normally held in elevated position above the pins as shown in Fig. 3 by means of springs 23 which encircle the posts and the lower ends of

which rest on the lateral projections 12. The pin-positioning block 22 has at its upper edge lateral extensions 24 provided with openings through which the posts 21 extend, these openings being provided with bushings 25 through which the posts pass.

The block 22 is formed with through vertical openings 26, each of a size to receive one of the pins 5, and these openings have the same relative positions and spacing as the pins 5 when they are properly set up on the platform.

As stated above the block 22 is normally held in its raised position above any pins which are set up on the platform 4. When the platform and the carrier 6 have been moved from their operative position shown in Fig. 2 into a position at the playing end of the alley as shown in dotted lines Fig. 1, then after the pin-supporting platform 4 has been cleared of pins, the pin-positioning block 22 is forced downwardly on the posts 21 nearly into contact with the alley bed, and while the block is held in such position the pins may be set up on the platform 4 by dropping the pins into the openings 26. This block 22 is retained in its lowered position during the return journey of the platform 4 from the dotted line position Fig. 1 to the full line position, thereby insuring that the pins will remain in their proper set-up positions during such journey. After the platform 4 has reached its operative position at the right hand end of the alley in Figs. 1 and 2, then the block 22 is released and the springs 23 act automatically to raise the block into its elevated position above the pins, thereby leaving the pins set up on the platform 1 ready for the play.

The upper edge of the basket 6 is connected to a transversely extending rod or wire 27 which is connected by arms 28 to the upper end of the rear posts 21, and these posts, therefore, serve to assist in holding the basket in its pin-receiving position.

For holding the block 22 in its lower depressed position in opposition to the springs 23, said block is provided with spring pressed latches 29 which are adapted to engage underneath side rails 30 that extend the length of the alley bed and are situated one on each side thereof. The upper ends of these rails are provided at the playing end with inclined surfaces 31 arranged so that when the block 22 is depressed from its elevated position shown in Fig. 3 to its lowered position, the ends of the latches wipe by the inclined faces 31, thus moving the latches inwardly and when the block is in its lowered position the springs 32 serve to move the latches outwardly underneath the lower faces 33 of the rails 30, thereby holding the block in its lowered or depressed position.

As stated above, after the block has thus been latched in lowered position, then the pins are set up by dropping them into the openings 26 after which the motor 14 is operated to return the platform 4 from the playing end of the alley to the opposite end. During this return journey the latches maintain their engagement with the under surfaces 33 of the rails 30 thus holding the block 22 in its lowered position, which in turn holds the pins in upright position.

When the platform and the block have been returned to their operative position, then the latches are withdrawn against the action of the springs 32 by means provided for that purpose, thus allowing the block 22 to be moved upwardly above the pins by means of the springs 23.

I have stated above that when the platform 4 is to be moved forwardly from its operative po-

sition shown in Fig. 2 to the playing end of the alley for the purpose of transporting the pins and balls to said playing end, said platform is first raised to lift it above the level of the bed 1. While any suitable means for thus raising the platform may be used, I have herein illustrated for this purpose two solenoids 34 which are suitably supported in the framework of the alley and the core of each of which carries at its upper end a roll 35 resting against the underside of the platform support 31. These solenoids are so constructed that when they are energized the core 36 thereof is moved upwardly, thereby causing the rolls 35 to lift the support 31 and the platform 4 to bring the latter above the level of the alley bed 1 as shown in dotted lines in Fig. 6. These solenoids may be energized from any suitable source, but I will preferably provide means whereby when the switch mechanism for operating the motor 13 is actuated the first movement of the switch will energize the solenoids 34, thus raising the platform 4 and further or continued movement of the switch will close the circuit of the motor 13 and thus cause the platform 4 to be moved off from the support 31 and forwardly over the alley bed 1.

There is shown in Fig. 5 a wiring diagram by which this sequence of operations may be carried out. The circuit for the motor 13 is indicated at 37, said circuit leading to and being connected to a source of current supply 38. This motor circuit 37 has a switch therein comprising two terminals 39 and a bridging contact 40, the latter being connected to and actuated by a push button 41. The circuit for the solenoids 34 is indicated at 42, and it is also connected to the source of current supply 38. This circuit 42 has in it two elongated contacts 43 adapted to be closed by a bridging contact 44 that is also carried by the push button stem 41. The contacts 43 and 39 are so disposed that the first or initial movement of the push button stem 41 will close the contact 44 onto the contacts 43, thus closing the solenoid circuits 42, while further movement of the push button stem 41 will bring the bridging contact 40 against the contacts 47, thus closing the motor circuit. When the push button 41 is thus actuated, the circuit 42 of the solenoids 34 will thus first be closed causing said solenoids to function to raise the platform 4, after which the circuit 37 of the motor will be closed, thus setting the motor in operation to move the platform 4 from its operative position to the playing end of the alley.

Means are provided whereby when the platform reaches the playing end of the alley, the motor circuit will be automatically opened, thus bringing the platform to rest. For this purpose the circuit 37 for the motor 13 is provided with two normally closed switches 45, each switch comprising a pair of contacts 46 and a bridging contact 47 that is normally held in engagement with the contacts 46 by a spring 48. Each bridging contact has a stem 49 extending therefrom and the pin-supporting platform 4 is provided with two stop projections 50 situated to engage the stems 49 when said platform reaches the limit of its movement toward the playing end of the alley. The engagement of the stops 50 with the stems 49 will open the switches 45 and thus open the motor circuit, as shown in Fig. 5.

The circuit by which the motor 14 is controlled is indicated at 51. This includes a switch herein shown as comprising two contacts 52 and a bridging contact 53 which is provided with a push

button stem 54. The circuit 51 is connected to the source of current supply 38.

The push button stem 54 is shown as being connected to the push button stem 41 in such a way that when the circuit of one motor is closed, the circuit of the other motor will be opened. As herein shown the two push button stems 41, 54 are connected by pin and slot connections 55 to opposite ends of a lever 56 which is centrally pivoted at 57 so that when either stem is moved forwardly to close the corresponding motor circuit, the other stem will be moved backwardly to open the other motor circuit.

Reference has been made to the spring pressed latches 33 by which the block 22 is retained in its lowered position. While any suitable means may be employed for releasing these latches after the platform 4 with the pins set up thereon has been returned to its operative position, I will preferably employ solenoids for this purpose which may be actuated from a push button located at the playing end of the alley. Each latch 29 is provided with a stem 58 which constitutes the core of a solenoid 59. These solenoids 59 are connected in parallel in a circuit 60 which has a push button switch 61 therein and which is connected to and takes current from the source of current supply 38. This push button switch comprises the usual stationary contacts 62 and the movable bridging contact 63 which is normally held out of engagement with the stationary contacts by the spring 64. After the platform 4 with the pins set up thereon has been returned to its operative position at the right hand end of the alley in Figs. 1 and 2, then the operator will actuate the push button switch 61, thereby to close the circuit 60 of the solenoids 59 which will result in withdrawing the latches from engagement with the under faces 33 of the rails 30 thereby allowing the block 22 to be moved by the springs 23 up into its raised position above the pins.

I have herein shown a connection between the basket 6 and the platform 4 which permits the lower edge of the basket to be drawn forwardly over the platform after said platform and basket have been moved to their position at the playing end of the alley, thereby bringing the pins and balls within convenient reach of the player.

The lower edge 65 of the basket 6 is connected to two pull rods 66, one of which is situated on each side of the platform 4, said rods being movable forwardly on the platform and being guided in their movement by guides 67. The front end of each rod is shown as bent into a hook shape 68 which is adapted to hook around the front edge 69 of the platform 4. When the platform and the carrier 6 have been moved to the playing end of the alley, the player may grasp the hook ends 68 of the pulling rods 66 and draw said rods forwardly, thereby pulling the lower end of the basket 6 forwardly over the platform as shown in Fig. 7. This will bring the pins and balls carried by the basket or carrier forwardly within convenient reach of the player so that he may remove them from the basket or carrier. After this has been done, the rods are returned to their normal position, thereby moving the lower end 65 of the basket backwardly to the rear of the platform. The platform is then cleared ready to have the block 22 moved downwardly into pin-receiving position. As stated above, after the block has been moved downwardly, the pins are dropped into the pockets or holes 26 and are thereby properly set up on the platform.

The platform 4, with the pins thus properly set up thereon and retained in position by the block 22, is then returned to its operative position as shown in Fig. 1, and the latches 29 are released to allow the block to be raised by the springs 23, thus leaving the pins standing on the platform in their upright position and properly set up for the play.

If during the play any pin or ball drops into and remains in either gutter 82, such pin or ball will be moved forwardly along the gutter by the forward movement of the platform 4, thereby insuring that all balls and pins are returned to the player for him to set up. It will, therefore, be seen that I have provided a novel bowling alley in which each player can set up his own pins without leaving the playing end of the alley.

I claim:

1. A bowling alley comprising an alley bed, a pin-supporting platform at one end of the bed for supporting the pins when they are set up, a basket element in the rear of the platform to receive the pins which have been knocked down, and means to move the platform and basket together with the pins and balls carried thereby from their operative position at said end of the alley bed to a position at the opposite or player's end of the alley, whereby the player may set the pins up again on the platform without leaving said player's end of the alley.

2. A bowling alley comprising an alley bed, a pin-supporting platform at one end of the bed for supporting the pins when they are set up, a basket element in the rear of the platform to receive the pins which have been knocked down, means to move the platform and basket together with the pins and balls carried thereby from their operative position at said end of the alley bed to a position at the opposite or player's end of the alley, whereby the player may set the pins up again on the platform without leaving said player's end of the alley, and means to move the platform with the set-up pins thereon back to its operative position.

3. A bowling alley comprising an alley bed, a pin-supporting platform at one end of the bed for supporting the pins when they are set up, a basket element in the rear of the platform to receive the pins which have been knocked down, means to move the platform and basket together with the pins and balls carried thereby from their operative position at said end of the alley bed to a position at the opposite or player's end of the alley whereby the player may set the pins up again on the platform without leaving said player's end of the alley, means to move the platform with the set-up pins thereon back to its operative position, and means to hold the pins in upright position during the return journey of the platform.

4. A bowling alley comprising an alley bed, a pin-supporting platform on which the pins are set up, said platform normally having an operative position at one end of the alley bed and flush therewith, a pin-receiving element associated with the platform to receive the pins as they are knocked down, means to raise the platform slightly above the alley bed, and means to move the platform and pin-receiving element over the alley bed from its operative position to a position at the playing end of the bed, whereby the player may set up the pins again on the platform without leaving his station.

5. A bowling alley comprising an alley bed, a pin-supporting platform on which the pins are set up, said platform normally having an operative position at one end of the alley bed and flush therewith, a pin-receiving element associated with the platform to receive the pins as they are knocked down, means to raise the platform slightly above the alley bed, means to move the platform and pin-receiving element over the alley bed from its operative position to a position at the playing end of the bed, whereby the player may set up the pins again on the platform without leaving his station, and means to move the platform with the set-up pins thereon back to its operative position.

6. A bowling alley comprising an alley bed, a pin-supporting platform on which the pins are set up, said platform normally having an operative position at one end of the alley bed and flush therewith, a pin-receiving element associated with the platform to receive the pins as they are knocked down, means to raise the platform slightly above the alley bed, means to move the platform and pin-receiving element over the alley bed from its operative position to a position at the playing end of the bed, whereby the player may set up the pins again on the platform without leaving his station, means to move the platform with the set-up pins thereon back to its operative position, and means to hold the pins in upright position during the return journey of the platform.

7. A bowling alley comprising an alley bed, a pin-supporting platform at one end of the bed for supporting the pins, a basket element in the rear of the platform to receive the pins which have been knocked down, means to move the platform and basket together with the pins and balls therein from their operative position at said end of the alley bed to a position at the player's end of the alley, a pin-positioning block supported directly over the platform, said block having openings therethrough into which the pins may be dropped on to the platform in their properly set-up positions, means to move the platform and said block from the playing end of the alley bed to the opposite end, said block holding the pins in their set-up position during such return journey, and means to remove said block, thereby freeing the pins.

8. A bowling alley comprising an alley bed, a pin-supporting platform at one end of the bed for supporting the pins, a basket element in the rear of the platform to receive the pins which have been knocked down, means to move the platform and basket together with the pins and balls therein from their operative position at said end of the alley bed to a position at the player's end of the alley, a pin-positioning block associated with the platform, springs normally holding said block yieldingly in elevated position above the platform a distance greater than the height of the pins, means to latch the block in lowered position close to the platform, said block having openings therethrough into which the pins can be dropped on to the platform, means to move the platform with the block in lowered position from the playing end of the alley to the opposite end thereof and means to release said latches when the platform arrives at said opposite end, whereby the springs elevate the block above the pins and leave them properly set up.

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