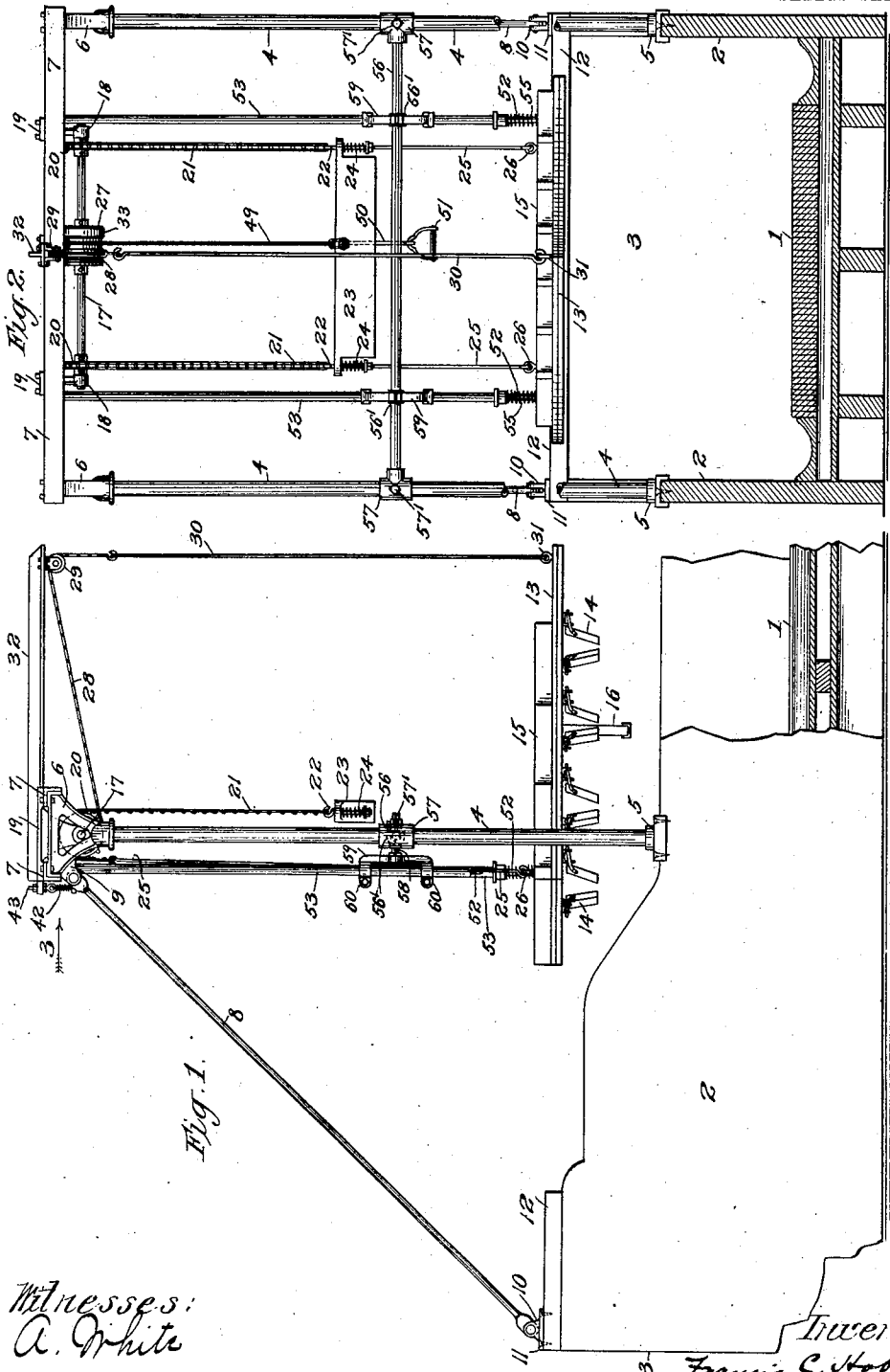


F. C. HOBBS.
PIN SETTING APPARATUS FOR BOWLING ALLEYS.
APPLICATION FILED FEB. 3, 1910.

998,001.

Patented July 18, 1911.

2 SHEETS—SHEET 1.



Witnesses:
A. White
J. J. Kearns,

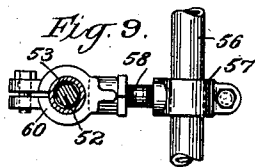
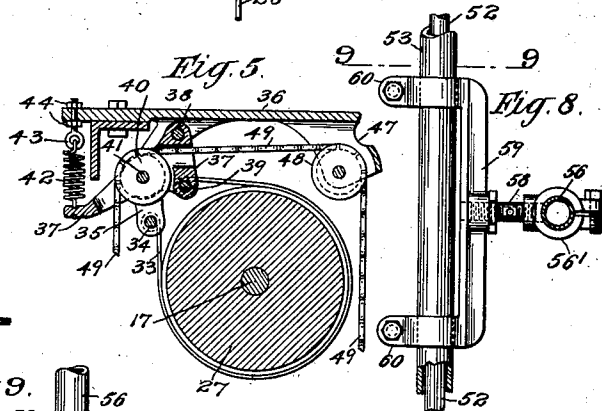
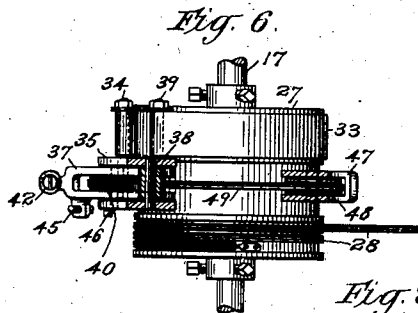
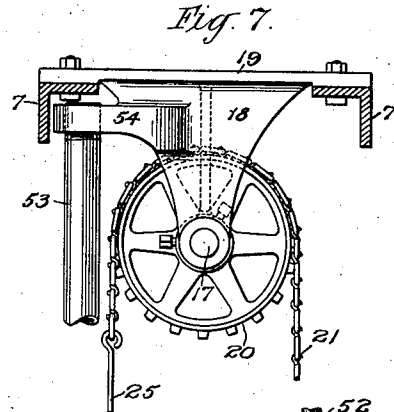
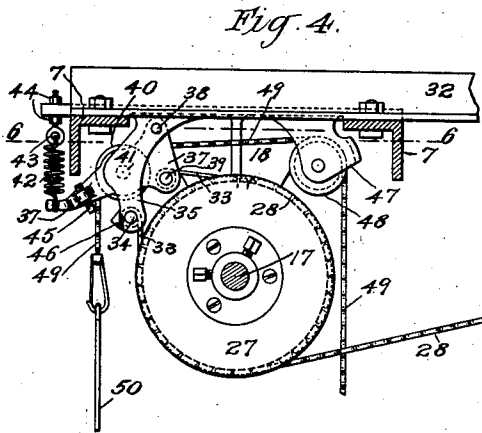
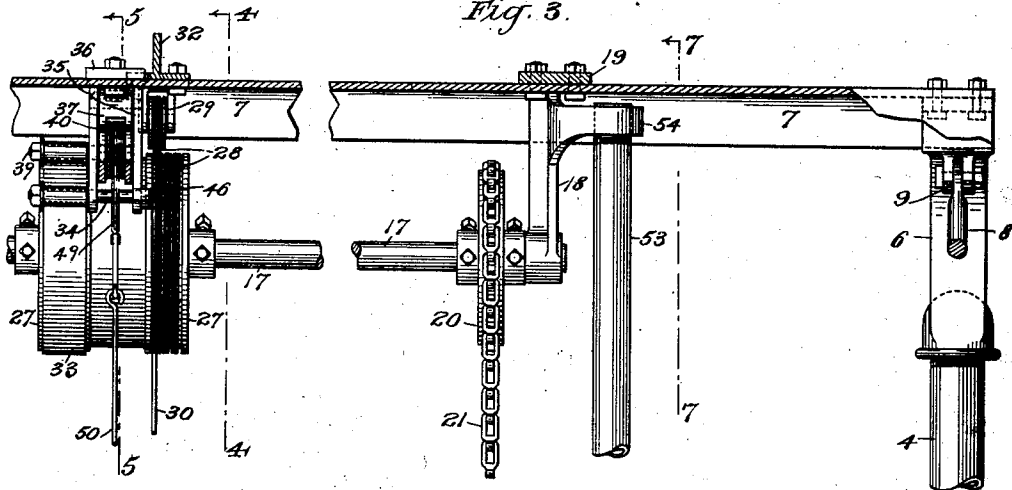
Inventor:
Francis C. Hobbs
By his Attys:
Philip Dange Rice & Howard

F. C. HOBBS.
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2 SHEETS—SHEET 2.



Witnesses:
A. White
J. J. Kearns,

Inventor:
Francis C. Hobbs
by his Attys.
Philip Sawyer, Rice & Kennedy

UNITED STATES PATENT OFFICE.

FRANCIS C. HOBBS, OF NEW YORK, N. Y., ASSIGNOR TO THE BRUNSWICK-BALKE-COLLENDER COMPANY OF NEW YORK, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PIN-SETTING APPARATUS FOR BOWLING-ALLEYS.

998,001.

Specification of Letters Patent. Patented July 18, 1911.

Application filed February 3, 1910. Serial No. 541,816.

To all whom it may concern:

Be it known that I, FRANCIS C. HOBBS, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Pin-Setting Apparatus for Bowling-Alleys, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to improvements in pin setting apparatus for bowling alleys.

A pin setting apparatus for bowling alleys has been heretofore employed which comprises a pin carrier or frame adapted to be loaded with the bowling pins, after which it is moved down to deposit the pins upon the proper spots on the alley bed. In the construction referred to, the pin carrier is operated from a roll by means of ropes. A counterbalance, which is heavier than the frame but lighter than the frame and the load of pins when the pins have been placed upon it, is employed, this counterbalance being connected to the carrier by the ropes by which the carrier is operated, these ropes being given one or more turns about the roll. To prevent the roll from being rotated except when desired, there is employed a brake-band operated by a lever arm which extends forwardly under the roll, this lever being actuated by a rope connected to the counterbalance. The lever arm through which the rope passes lies beneath the roll, the rope passing from the counterbalance through the lever arm, then over the roll and through a pulley, the depending end of the rope being provided with a handle. The arrangement is such that the rope is given a bend between the roll and the counterbalance, and when the rope is pulled the lever is swung forward and releases the band. In this construction there is constant wear upon the operating rope as it reeves through the opening in the lever arm, and, also, a constant rubbing action between the rope and the roll over which it passes which, in a short time, wear out the operating rope. Furthermore, in the construction described, the operating parts are supported either by hangers secured to the ceiling above the alley, or, in some cases, by a wooden framework either mounted on the alley or on the walls of the

room in which the alley is located. In order to obtain the requisite stiffness, comparatively heavy timbers need to be employed which are not only cumbersome in appearance but make an expensive construction. Further than this, there is a tendency of the timbers to warp after the construction is erected, thus throwing the operating parts out of line. In this construction, also, great accuracy is required in the framing, because the travel of the pin setting frame must be very accurate, as the pins necessarily must be deposited on the alley bed in exact register with the spots, and, even when such accuracy is obtained in the first instance, the warping of the timbers referred to tends to so shift the parts as to interfere with the accurate travel of the pin carrier.

One of the objects of this invention is to produce a pin setting apparatus of the character described in which a simple, compact and cheap framework for the structure shall be employed, this framework consisting of few parts and being capacitated to be mounted on the sides of the alley bed.

A further object of the invention is to construct a pin setter of the character described in which provision is made for adjusting the travel of the pin carrying frame, thereby doing away with the necessity for extreme accuracy in setting up the apparatus.

A further object of the invention is to produce a pin setting apparatus of the class described in which the brake operating mechanism shall be efficient and durable.

The invention further has in view the improvement of other details of pin setting apparatus which will be more specifically referred to hereinafter.

With these and other objects not specifically referred to in view, the invention consists in certain constructions, and in certain parts, improvements and combinations as will be hereinafter fully described and then specifically pointed out.

Referring to the accompanying drawings:—Figure 1 is a side elevation of a bowling alley containing a form of pin setting apparatus which embodies the invention. Fig. 2 is an elevation, with the sides and body of the alley shown in section, the position of the observer being assumed to be at the player's end of the alley. Fig. 3 is a

detail elevation, on an enlarged scale, partly in section, illustrating certain features of the construction at the upper end of the frame, the position of the observer being indicated by the arrow 3 in Fig. 1. Fig. 4 is a section on the line 4—4 of Fig. 3. Fig. 5 is a section on the line 5—5 of Fig. 3. Fig. 6 is a plan view of the brake drum, the brake actuator being shown in section. Fig. 7 is a section on the line 7—7 of Fig. 3. Figs. 8 and 9 are detail views.

In the drawings, which illustrate one embodiment of the invention, 1 indicates the playing bed of the alley, the sides of the alley and the rear being marked 2, these sides, in connection with the back 3, constituting what is known as the "kick-back" which incloses the pin section of the alley bed and also the pit of the alley, not shown.

Constructions embodying the invention will include a frame which, in the best constructions, will consist of a single pair of uprights 4 supported on the sides 2 of the alley. These uprights may consist of metal tubing and may be screwed at their lower ends into sockets 5 secured by screws to the sides of the alley. These uprights, in the particular construction shown, carry, at their upper ends, castings 6 connected by a cross-plate which, as shown, consists of a pair of angle-irons 7. To insure rigidity, a brace, comprising a pair of rods 8, may be employed, each of these rods being bolted to ears 9 on the castings 6 and to ears 10 formed on a plate 11 which may be secured to a plank 12 forming a part of the alley structure. Constructions embodying the invention will also include a pin carrier the details of construction of which may be varied. As shown, it consists of a triangular frame 13 carrying pivoted pin guides 14, and on this frame is mounted a pin holding and shifting frame 15 the movement of which is effected by a shifter leg 16.

The details of construction of the pin carrier have no special reference to the invention, and furthermore, are well understood in the art. The pin-carrier here particularly illustrated is substantially like that shown in the patent to Backus, No. 809,890 to which reference is made for a full description of the construction and operation of this part of the apparatus.

The pin carrying frame will, in constructions embodying the invention be operated to move toward and away from the bed by means of a roll or shaft and suitable connections. The particular details of construction for moving the pin carrier may be varied. As shown, there is provided a shaft 17 journaled in hangers 18 depending from plates 19 bolted or otherwise secured to the angle-irons 7. The shaft 17 carries sprocket wheels 20 over which run sprocket chains 21 secured to eye-bolts 22 which pass

through openings in a counterbalance 23 and are surrounded by springs 24, the counterbalance being thus elastically connected to the chains. At the other end, the chains are connected to rods 25 connected, in turn, to eye-bolts 26 fast on the triangular frame 13 of the pin carrier. The shaft is also provided with a drum, as 27, over which passes a flexible connection consisting, as shown, of a chain 28 which passes over a pulley 29 and is connected to a rod 30 connected in turn to an eye-bolt 31 at the apex of the triangular frame 13. The pulley 29, as shown, is carried on an arm or support 32 bolted to the angle bars 7 and extending over the pin section of the alley.

It will be understood that the counterbalance, as usual in constructions of this character, will be heavier than the pin carrier itself but that the combined weight of the pin carrier and the pins to be loaded on the carrier when in its upper position, will exceed the weight of the counterbalance. It is apparent, therefore, assuming the parts to be in the position shown in Fig. 1, if the pins be loaded upon the pin carrier, the pin carrier will descend, raising the counterbalance, unless the shaft is restrained from rotation.

In order to prevent the rotation of the shaft except at the desired times, a brake mechanism will be employed, the construction of which may be varied. As shown, the brake mechanism includes a brake-band, as 33, this brake-band surrounding the drum 27 and being connected at one end to a pin 34 mounted on a bracket 35 depending from a plate 36 bolted to the angle iron 7. The other end of this brake-band, when this form of brake is employed, will be connected to a brake-actuator, the construction of which may be varied. As shown, this actuator consists of a block 37 pivoted on a pin 38 mounted on the bracket 35. This actuator block is provided with a pin 39 to which the other end of the brake-band 33 is connected. The actuator-block is further provided with a pulley 40 mounted on a pin 41 on the block. In the particular construction illustrated, the actuator is held normally in such position that the brake-band is operating to restrain the rotation of the shaft 17 by means of a spring 42, this spring being connected to the tail of the actuator block and to an eye-bolt 43 which passes through the plate 36. This eye-bolt is held in position by nuts 44, this construction permitting an adjustment of the eye-bolt to vary the tension of the spring. It is apparent that when the actuator-block is rocked down against the tension of the spring, the brake-band will be released and the shaft 17 permitted to rotate.

It is desirable to prevent a too rapid rotation of the shaft under the pull of the

loaded pin carrier, and this may be conveniently effected by controlling the amount of release of the brake-band effected by the actuator. While this may be accomplished in various ways, in the construction illustrated the end of the actuator is provided with an adjustable set-screw 45 tapped through an ear on the actuator tail, this screw coöperating with an abutment 46 formed on the bracket 35. It is apparent that, by adjusting this screw 45, the downward movement of the actuator and the consequent amount of release of the brake-band may be controlled, that is to say, while the brake-band may be released sufficiently to permit the shaft 17 to turn, it still exercises a slight dragging action thereon so as to prevent too rapid rotation of the shaft.

The means for operating the actuator may be varied, but in the best constructions embodying the invention it will be operated by flexible connections extending to the counterbalance. In the particular construction illustrated, the plate 36 is provided with a bracket 47 on which is mounted a pulley 48. As shown, this pulley is located over the counterbalance. As shown, furthermore, there is provided a flexible connection or operating chain 49 having connected to it a rod 50 to which is connected an operating handle 51 conveniently located to be seized by the pin boy. This chain 49 runs over the pulley 40 on the actuator and the pulley 48, and is connected at its end to the counterbalance. It is apparent that when the pin boy seizes the handle and pulls on the chain 49, the actuator 37 will be rocked downward to release the brake; the pull of the chain being resisted by the weight of the counterbalance. It will be observed that the operating connection or chain 49 has a straight run from the counterbalance to the pulley 48, a straight run between the pulleys 48 and 40, and a straight downward run from the pulley 40. This arrangement of the chain reduces the wear to a minimum and makes an exceedingly efficient operating connection.

The pin carrier is required to deposit the pins on the spots on the pin-section of the alley so that the bases of the pins will be in exact register with the spots on the alley, the importance of this exactness of position being well-understood by bowlers. In the best constructions embodying the invention, therefore, suitable guides will be provided to insure the accuracy of movement of the pin carrier. While the construction of guides for the pin carrier employed may be varied, as illustrated, the frame 13 of the pin carrier is provided with upwardly extending members 52 which telescope in guide rods or tubes 53, the upper ends of which are supported in arms 54 extending from the brackets 18 before referred to. The mem-

bers 52 may be surrounded at their lower ends by springs 55 which bear against the lower ends of the rods or tubes 53 and cushion the upward movement of the pin carrier.

While the frame comprising the uprights 4 and the connected parts might be set so accurately with respect to the pin spots as to insure the proper delivery of the pins upon the spots, it is difficult to accomplish this, particularly where the frame structure covers a number of alleys in which the spotting of the pin sections of each alley is not entirely uniform with the other alleys. For this and other reasons not necessary to refer to at length, in constructions embodying the invention in its best form, means will be provided for adjusting the guides for the pin carrier so as to insure that it properly delivers the pins to the spots. While the means by which this adjustment is effected may be varied, as shown, the uprights 4 carry a cross-rod or transverse bar 56 secured in couplings 57 slidingly mounted on the uprights 4 and secured in position by set-screws 57'. This rod or bar 56 is surrounded by a pair of clamp couplings 56' into each of which is threaded a right and left hand threaded adjusting bolt 58 also threaded into a boss on a bracket 59 provided with clamp couplings 60, each of these couplings embracing one of the rods or tubes 53 before referred to. It is apparent that by turning the screws 58 the tubes 53 can be adjusted toward or away from the uprights 4 to vary the line of travel of the carrier. The tubes 53 have been before referred to as threaded into the brackets 54. When this method of connection is employed, it will be understood that the connection should be sufficiently loose to permit a slight swinging movement of the tubes. It will be understood that the adjustment to be provided is a limited one, as the uprights can be set with comparative accuracy without difficulty.

While the drawings illustrate what is considered to be the best construction for carrying the invention into effect, it will be understood that changes and variations may be made in said construction. The invention claimed is not, therefore, to be restricted to the specific construction hereinbefore described and illustrated in the accompanying drawings.

What is claimed is:—

1. In a pin setting apparatus for bowling alleys, the combination with the sides of the alley, of a frame comprising a single pair of uprights mounted thereon and a cross-plate connecting the upper ends of the uprights, a brace for the frame, a support connected to the crossplate and extending over the alley bed, a pin carrier, a shaft mounted in the frame for operating the pin carrier, a flexi-

ble connection between the shaft and the carrier, a guide for said connection carried by the support, and additional flexible connections between the shaft and the carrier.

2. In a pin setting apparatus for bowling alleys, the combination with the sides of the alley, of a frame comprising a single pair of uprights mounted thereon and a cross-plate connecting the upper ends of the uprights, a brace for the frame, a support connected to the cross-plate and extending over the alley bed, a pin carrier, a shaft mounted in the frame for operating the pin carrier, a drum on the shaft, a guide on the support, a flexible connection extending from the drum through the guide on the support to the pin carrier, sprocket wheels on the shaft, a counterbalance, and connections including chains extending from the counterbalance over the sprocket wheels to the carrier.
3. In a pin setting device, a supporting frame including spaced uprights having end brackets secured thereto, a cross-plate connecting said brackets, intermediate shaft supporting hangers depending from the cross-plate and provided with laterally extending arms having sockets formed therein, a transverse bar connecting the uprights, a pin carrier, guide rods having their lower ends operatively connected with the pin carrier and their upper ends seated in said sockets, and a connection between the transverse bar and each guide rod.
4. In a pin setting device, a stationary supporting frame, shaft supporting hangers depending from the stationary frame, guide rods depending from the hangers, a transverse bar forming a part of the supporting frame, and a connection between the transverse bar and each guide rod.
5. In a pin setting device, a supporting frame including spaced uprights having end brackets secured thereto, a cross-plate connecting said brackets, intermediate shaft supporting hangers depending from the cross-plate and provided with laterally extending arms having sockets formed therein, a pin carrier, guide rods having their upper ends seated in the sockets of the hangers and their lower ends operatively connected with the pin carrier, a transverse bar connecting the uprights of the supporting frame, connecting brackets having clamp couplings embracing the guide rods, couplings mounted on the transverse bar, and a threaded pin forming a connection between each connecting bracket and the adjacent coupling on the transverse bar.
6. In a pin setting apparatus for bowling alleys, the combination with the sides of the alley, of a frame mounted thereon, a pin carrier, means carried by the frame to effect the raising and lowering of the pin carrier, guide members mounted on the carrier, tubes in which said members telescope, and

means for adjustably connecting the tubes to the frame.

7. In a pin setting apparatus for bowling alleys, the combination with a pin carrier, of a shaft, connections including a counterbalance whereby the shaft effects the raising and lowering of the pin carrier, a brake mechanism for the shaft, a brake actuator, and a flexible operating connection passing through the actuator and then over the shaft to the counterbalance.

8. In a pin setting apparatus for bowling alleys, the combination with a pin carrier, of a shaft, connections including a counterbalance whereby the shaft effects the raising and lowering of the pin carrier, a brake mechanism including a brake band, a pivoted brake actuating block connected to the brake band, a flexible operating connection passing through the block and over the shaft to the counterbalance, said connection operating to move the block to release the brake, and a spring connected to the block and acting in opposition to said flexible connection.

9. In a pin setting apparatus for bowling alleys, the combination with a pin carrier, of a shaft, connections including a counterbalance whereby the shaft effects the lowering and raising of the carrier, a brake mechanism, an actuator for said mechanism, operating means for the actuator, and adjustable means independent of the connections between the actuator and the brake for controlling the movement of the actuator.

10. In a pin setting apparatus for bowling alleys, the combination with a pin carrier, of a shaft, connections including a counterbalance whereby the shaft effects the raising and lowering of the carrier, a brake mechanism including a brake band, a pivoted actuator block for operating the band, means for operating the block, and adjustable means independent of the connections between the actuator and the brake for determining the movement of the block.

11. In a pin setting apparatus for bowling alleys, the combination with a pin carrier, of a shaft, connections including a counterbalance whereby the shaft effects the raising and lowering of the carrier, a brake mechanism including a brake band, an actuator block for the brake band, flexible connections extending through the block and over the shaft to the counterbalance for operating the block, a spring acting in opposition to the operating connections, and a set screw and cooperating abutment for limiting the movement of the block.

12. In a pin setting apparatus for bowling alleys, the combination with a pin carrier, of a shaft, connections including a counterbalance whereby the shaft effects the raising and lowering of the carrier, a brake mechanism including an actuator, a flexible con-

nection extending through the actuator to the counterbalance, and a pulley located between the actuator and the counterbalance and over the counterbalance.

5 13. In a pin setting apparatus for bowling alleys, the combination with a pin carrier, of a shaft, connections including a counter-
balance whereby the shaft effects the raising
and lowering of the carrier, a brake mecha-
10 nism including a brake-band, a pivoted ac-
tuator block carrying a guide pulley, a sec-
ond guide pulley located over the counter-
balance, and a flexible connection extending
around said pulleys and to the counter-
15 balance for operating the block.

14. In a pin setting apparatus for bowling
alleys, the combination with a pin carrier,
of a shaft, connections including a counter-
balance whereby the shaft effects the raising
20 and lowering of the carrier, a brake mecha-
nism including a brake-band, a pivoted ac-
tuator block carrying a guide pulley, a sec-
ond guide pulley located over the counter-
balance, a flexible connection extending
25 around said pulleys and to the counter-
balance for operating the block, and a spring

connected to the actuator block operating in
opposition to the flexible connection.

15. In a pin setting apparatus for bowling
alleys, the combination with a pin carrier, 30
of a shaft, connections including a counter-
balance whereby the shaft effects the raising
and lowering of the carrier, a brake mecha-
nism including a brake-band, a pivoted ac-
tuator block carrying a guide pulley, a sec- 35
ond guide pulley located over the counter-
balance, a flexible connection extending
around said pulleys and to the counter-
balance for operating the block, a spring
connected to the actuator block operating in 40
opposition to the flexible connection, and
means including a set screw and coöperating
abutment for limiting the movement of the
block.

In testimony whereof, I have hereunto set 45
my hand, in the presence of two subscribing
witnesses.

FRANCIS C. HOBBS.

Witnesses:

A. WHITE,
J. J. KEARNS.