

L. A. BRIGEL.
 BOWLING ALLEY PIN SETTING MECHANISM.
 APPLICATION FILED FEB. 1, 1909.

941,611.

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 2 SHEETS—SHEET 1.

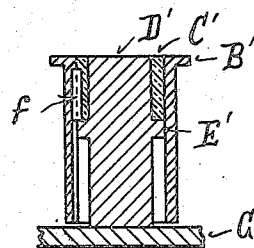
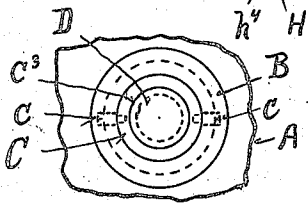
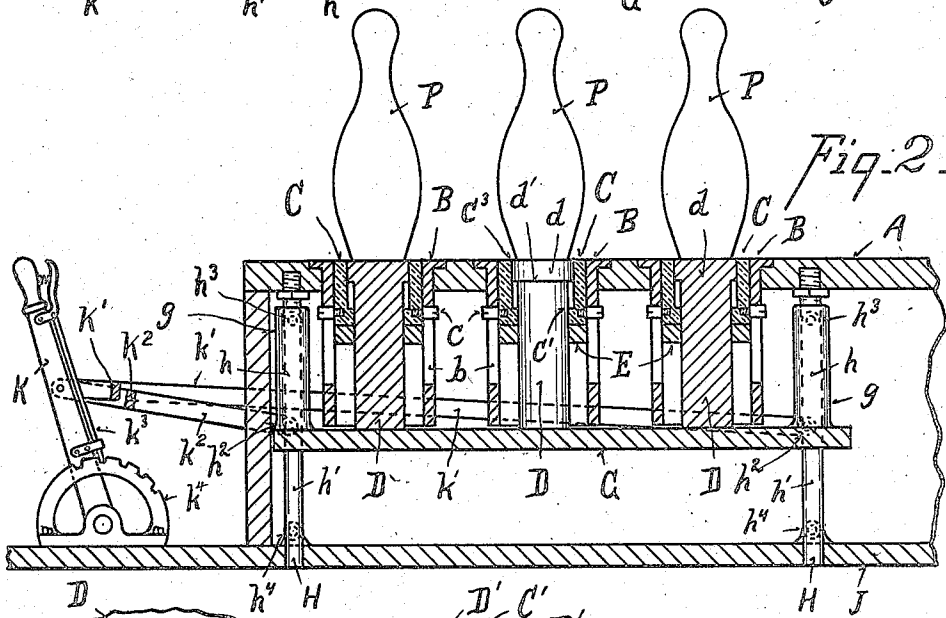
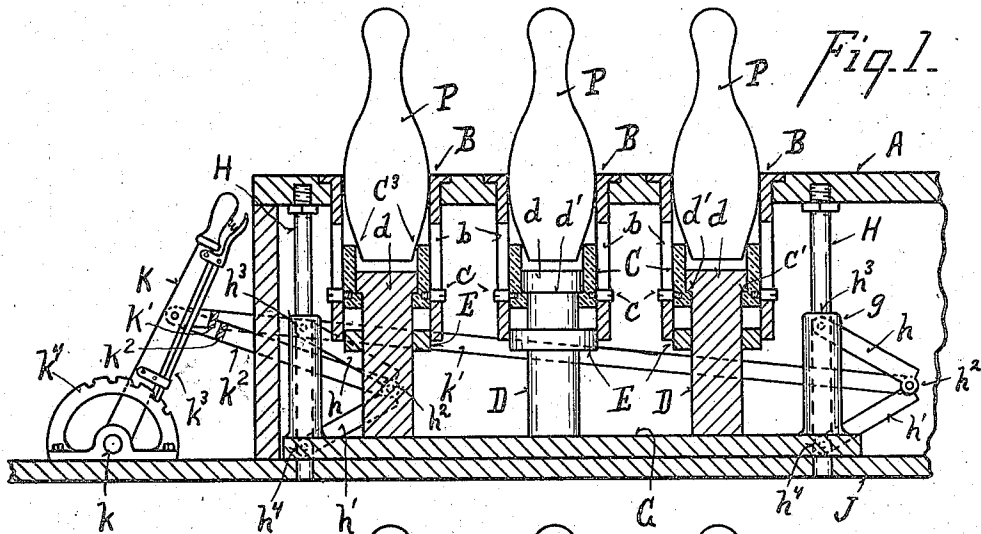


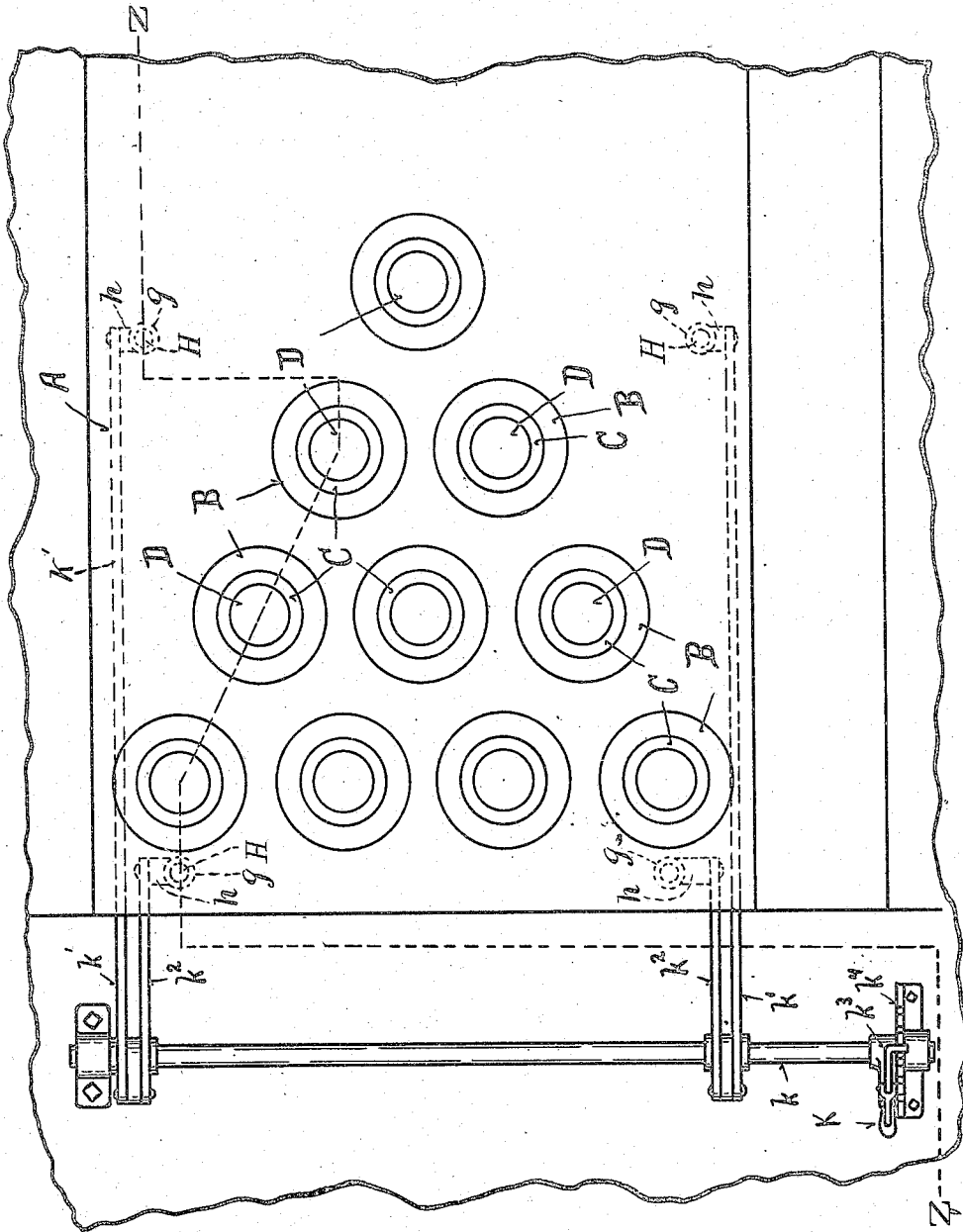
Fig. 3.
 Witnesses
 A. McCormack.
 Walter F. Murray

Inventor
 Leo A. Brigel
 By
 C. W. Miles
 Attorney

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Inventor

Leo A. Brigel

Witnesses

E. M. Calvert
A. Mc Connack

Fig. 5.

By

C. W. Miles

Attorney

UNITED STATES PATENT OFFICE.

LEO A. BRIGEL, OF CINCINNATI, OHIO.

BOWLING-ALLEY PIN-SETTING MECHANISM.

941,611.

Specification of Letters Patent.

Patented Nov. 30, 1909.

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To all whom it may concern:

Be it known that I, LEO A. BRIGEL, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Bowling-Alley Pin-Setting Mechanism, of which the following is a specification.

My invention relates to improved mechanism for setting the pins of bowling alleys. One of its objects is to provide mechanism for setting the pins without injury to the pins, particularly the bottom of the pins.

Another object is to provide mechanism by means of which the pins can be quickly and accurately set.

It further consists in certain details of form, combination and arrangement, all of which will be more fully set forth in the description of the accompanying drawings, in which:

Figure 1 is a central vertical section through an alley with my improvements applied, and with the pins in a position ready to be set, said section being on line $z-z$ of Fig. 5. Fig. 2 is a similar view showing the pins set. Fig. 3 is a detail showing one of the setting devices in top plan. Fig. 4 is a central vertical section through one of the pin setting devices, and illustrating a modification. Fig. 5 is a top plan view of the alley with the pins removed.

In the accompanying drawings A represents the floor of the alley on which the pins are set. At the points where the respective pins are to be set are inserted cylindrical sleeves B, which are preferably provided with one or more vertical slots b . Within the sleeves B and closely fitting the inner wall thereof are collars C, which are adapted to move vertically within the sleeves, and their movements therein limited by studs or screws c , which project into the slots b . An equivalent for the slots and studs would be to spline or key the collars to the sleeves. Within the collars C are plungers D, which closely fit the inner walls of the collars C. As shown in Figs. 1 and 2, the plungers D are provided with enlarged heads d , and shoulders d' adapted to engage shoulders c' of the collars to draw the collars downward within the sleeves, as shown in Fig. 1. Beneath the collars C are collars E, which are rigidly secured to the stem of the plungers D, and serve to engage the lower edges of the collars C to lift the said collars C when

the plungers D are elevated. As shown in Fig. 4, plunger D' has no enlargement at its upper end, but is of uniform diameter within the sleeve C'. The plunger D' may be provided with a detachable collar E as shown in Figs. 1 and 2, or with an annular integral rib E' as shown in Fig. 4. The sleeve B' and collar C' in Fig. 4 are shown splined together by a spline f .

The lower ends of the several plungers D rest upon a vertically moving platform or frame G, which is held in position and guided by means of sleeves g , which are fitted to and slide upon the vertical stationary rods H. As illustrated the platform G is raised and lowered by means of links $h-h'$ pivoted together at h^2 by a knuckle or prop joint. The end of link h opposite to joint h^2 is pivoted at h^3 to sleeve g , and the corresponding end of link h' is pivoted at h^4 to a bracket attached to the floor J. A latch controlled lever K is pivoted at k and connected by means of links $k'-k^2$ with the links $h-h'$ at their pivots h^2 , so that the movement of the lever K to the left will draw the pivot h^2 into vertical line with the pivots h^3-h^4 thereby elevating the platform G from the position Fig. 1 to that shown in Fig. 2. The latch k^3 engaging the segment k^4 locks the lever K in position. Other mechanism of various kinds may be employed to elevate the plungers or platform G, and my invention is not limited to any particular mechanism for elevating the plungers or platform G.

In practice the operator who sets the pins stands near the lever K, and with the plungers and collars in the position Fig. 1 the pins can be rapidly dropped into the upper ends of the several sleeves B, without danger of marring the bottoms of the pins, or parts on which the pins stand. The proportions of the collars C and plungers D are such with relation to the shape of the pins that the edges of the bottoms of the pins can not strike the upper edge of the collars or the tops of the plungers, thus in dropping the pins into place in the sleeves B, the only portions of the pins liable to damage are the sides of the pins, and not the bottoms on which the pins are to rest. When seated in the sleeves the weight of the pins is supported upon the upper edge c^3 of the collars C, which brings the pins accurately to a central position within the sleeves B. After the pins have all been seated in the sleeves

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 B the operator throws the lever K which elevates the plungers D, and by means of the collars E lifts the collars C, so that the upper faces of the collars C and plungers D come flush with the face of the sleeves B and the floor of the alley, and with the pins all seated centrally upon the top of the plungers D. As soon as the player is through rolling, the lever K is moved to the right lowering the platform G which carries the plungers D, and which in turn draw down the collars C. Any pins which may have been left standing will follow the plungers down and be recentered, and any pins which have been knocked down can be again placed in the sleeves B, and the platform G again elevated.

By the use of my improved mechanism the pins can be rapidly handled and reset and accurately centered or recentered, and the bottoms of the pins are protected from damage, thus insuring that the pins will wear longer and each have a smooth bottom of uniform diameter on which to rest.

In modification Fig. 4, the downward movement of the collar C' is dependent upon the force of gravity.

The mechanism herein illustrated and described is capable of considerable modification without departing from the principle of my invention.

Having described my invention, what I claim is:

1. In a mechanism of the character indicated, a series of sleeves stationarily supported with their upper ends flush with the alley floor and adapted to receive the lower ends of the pins, a series of vertically movable collars located within said sleeves and adapted in their lower position to support said pins by engagement with the sides of said pins above their bottoms, and vertically movable plungers located within said collars and adapted in their elevated position to support said collars in their elevated position with the upper faces of said collars and plungers flush with the alley floor, and to lift and support the pins upon said plungers.

2. In a mechanism of the character indicated, a series of sleeves stationarily supported with their upper ends flush with the alley floor and adapted to receive the lower ends of the pins, a series of collars located within said sleeves and having limited vertical movement relative to said sleeves, said collars being adapted in their lower position to support and center said pins by engagement with the side walls of said pins, a series of vertically movable plungers located within said collars, said plungers being out of engagement with said pins in their lower position, and adapted in their upward movement to engage and lift said pins and said collars so that the top of said collars and the bottom of said pins come to a posi-

tion flush with the alley floor, and means for raising and lowering said plungers.

3. In a mechanism of the character indicated, a series of sleeves stationarily supported with their upper ends flush with the alley floor and adapted to receive the lower ends of the pins, a series of vertically movable collars located within said sleeves and adapted in their lower position to support said pins by engagement with the sides of said pins above their bottoms, interengaging members carried by said sleeves and collars to limit the movements of said collars, and vertically movable plungers located within said collars and adapted in their elevated position to support said collars in their elevated position with the upper faces of said collars and plungers flush with the alley floor, and to lift and support the pins upon said plungers.

4. In a mechanism of the character indicated, a series of sleeves stationarily supported with their upper ends flush with the alley floor and adapted to receive the lower ends of the pins, a series of collars located within said sleeves and having limited vertical movement relative to said sleeves, said collars being adapted in their lower position to support and center said pins by engagement with the side walls of said pins, a series of vertically movable plungers located within said collars, interengaging members carried by said collars and plungers to raise and lower said collars in unison with the movements of said plungers, said plungers being out of engagement with the pins in their lower position, and adapted in their upward movement to engage and lift said pins and said collars so that the top of said collars and the bottom of said pins come to a position flush with the alley floor, and means for raising and lowering said plungers.

5. In a mechanism of the character indicated, a series of sleeves stationarily supported with their upper ends flush with the alley floor and adapted to receive the lower ends of the pins, a series of movable collars located within said sleeves and adapted in their lower position to support said pins by engagement with the side walls of said pins, a series of vertically movable plungers located within said collars and adapted in their elevated position to support said collars in their elevated position with the upper faces of said collars and plungers flush with the alley floor, and to lift and support said pins centrally upon said plungers, and mechanism adapted to raise and lower said several plungers in unison.

6. In a mechanism of the character indicated, a series of sleeves stationarily supported with their upper ends flush with the alley floor and adapted to receive the lower ends of the pins, a series of movable collars

located within said sleeves and adapted in
their lower position to support said pins by
engagement with the side walls of said pins,
a series of vertically movable plungers lo-
cated within said collars and adapted in
5 their elevated position to support said col-
lars in their elevated position with the upper
faces of said collars and plungers flush with
the alley floor, a vertically movable platform

supported upon vertical guides, said plat- 10
form supporting said several plungers, and
mechanism to raise and lower said platform.

In testimony whereof I have affixed my
signature in presence of two witnesses.

LEO A. BRIGEL.

Witnesses:

ALBERT W. SCHWARTZ,
C. W. MILES.