

F. HUGHES.

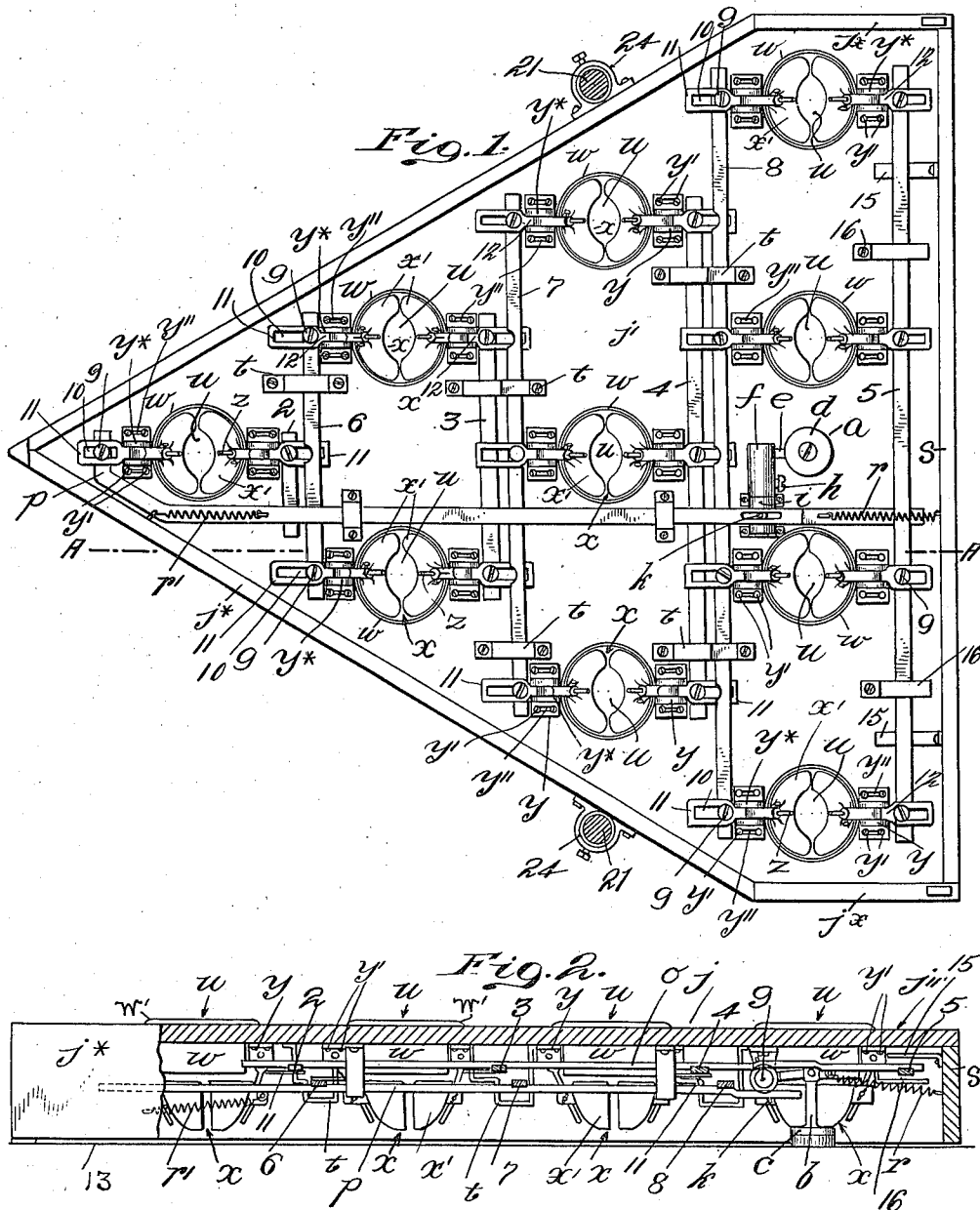
BOWLING PIN SPOTTER.

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996,250.

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2 SHEETS—SHEET 1.



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UNITED STATES PATENT OFFICE.

FRANK HUGHES, OF CLINTON, WISCONSIN.

BOWLING-PIN SPOTTER.

996,250.

Specification of Letters Patent. Patented June 27, 1911.

Application filed March 5, 1910. Serial No. 547,400.

To all whom it may concern:

Be it known that I, FRANK HUGHES, a citizen of the United States, residing at Clinton, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Bowling-Pin Spotters, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in bowling-pin spotters for use in spotting or positioning pins used in bowling alleys; and an object of my invention is to provide a spotter which will minimize the wear on the floor of the alley.

Another object of my invention is to provide an arrangement of parts in a spotter whereby the parts will be kept from the floor and that only one member of the operating mechanism will come in contact therewith.

A third object of my invention is to reduce the number of parts and particularly to avoid the use of a large number of springs.

A further object of my invention is to provide positioning devices which will be adjustable, to the end that the latter will fit accurately around the pins to hold the same against shifting and will release the latter properly and promptly at the desired time.

A fifth object of my invention is to provide a spotter in which the operating devices may be so arranged that the frame will not interfere with pins lying in the gutters of the alley and will not require such pins to be picked up, before the frame can be placed in position.

Other features of my invention will be hereinafter pointed out.

In the drawings illustrating the principle of my invention and the best mode now known to me of applying that principle, Figure 1 is a bottom plan of my new spotter; Fig. 2 is a section on the line A—A of Fig. 1; Fig. 3 is a detail in sectional elevation showing the main operating devices and one of the pin-positioning cups; Fig. 4 is a view of one of the pin-positioning cups, looking in the direction of the arrow X of Fig. 4; Fig. 5 is a detail in bottom plan of one of the positioning-cups; Fig. 6 is a detail in section of the main operating bars and the rock-shaft for actuating the same; and Fig. 7 is a detail showing

in elevation mechanism for raising and lowering the spotter.

The main actuator *a* is in the form of a post *b* the lower end of which is formed with a base or foot *c* provided with a cushion *d* of leather, rubber or like material, and the upper end of which is pivotally connected to the outer end of a rocker-arm *e*. The inner end of the latter is attached to a sleeve *f* which is fastened to the rock-shaft *g* by a set-screw *h*. The rock-shaft *g* is journaled in the lower end of a hanger *i* the upper end of which is fastened to the lower or inside face *j'* of the top *j''* of the frame *j* (Figs. 2 and 6). Through the rock-shaft *g* is passed a pin *k* the ends of which engage in apertures *m, n* formed in the upper main operating-bar *o* and the lower main operating-bar *p*, respectively. These operating-bars *o, p* are supported and guided in guide-brackets *q* which depend from the inside face *j'* of the top *j''*. One end of a coil-spring *r* is attached to an end of the operating-bar *o*, the other end of the spring being fastened to the base-end *s* of the frame *j*; and one end of a similar coil-spring *r'* is fastened to an end of the other operating-bar *p*, while the other end of the spring *r'* is secured to a side *j** of the frame *j* near the apex or point of the latter. It will be obvious from an inspection of Figs. 2 and 6 that the operating-bars *o, p* will be restored by the springs *r, r'* to their initial position after they have been displaced therefrom by turning the rock-shaft *g*.

The upper main operating-bar *o* carries the four cross-bars 2, 3, 4 and 5; and the lower main operating bar *p* carries the three cross-bars 6, 7 and 8. Straps *t* bent to form loops are fastened to the inner face *j'* of the top *j''* and serve as guides for the cross-bars which pass through them.

In the top *j''* of the frame *j* are formed the ten holes *u* in which may be inserted the pins *v* the lower or body part of one of which is shown in dotted lines in Fig. 4. Each hole *u* is provided with a tubular metal liner *w* formed with an outwardly-extending rim flange *w'*. Underneath each hole *u* there is arranged a two-part cup-shaped pin-holder *x*; and as these pin-holders are similar, it will be necessary to describe only one of them, reference being had to Figs. 3, 4 and 5 for this purpose. Near the edge of each hole *u* and diametrically opposite each

other are arranged two hangers y fastened to the inner face j' by screws y' which pass through slots y'' . These hangers are each formed with a pair of ears y^* between which is pivotally fastened the upper end of an arm z the lower end of which passes between the ears x'' which project from the cup-member x' of the pin-holder x . By tightening a screw-pin x^* the ears x'' may be forced together to grip firmly the pivoted arm z . It will be obvious that by loosening the screw-pin x^* , the cup-member x' may be shifted along its supporting arm z for purposes of adjustment. Upon the cross-bars are adjustably fastened by screws 9 which pass through slots 10 into the cross-bars, slotted plates 11 from which project actuating-fingers 12. Each plate 11 is formed with one of these actuating-fingers 12; and there is a plate 11 for each arm z , the finger 12 being arranged to actuate the adjacent arm z . The lower operating-bar p carries at one of its ends (Fig. 1) one of the slotted adjustable plates 11 and those of the plates 11 which are on the same side of the holes u as is this end plate are carried by the cross-bars 6, 7 and 8 which are fastened to the same operating-bar p , while those of the plates 11 which lie on the opposite side of the holes u are carried by the cross-bars which are attached to the upper operating-bar o . Since the operating-bars o , p are thrown in opposite directions by the turning of the rock-shaft g the two cup-members x' of each pin-holder x will be swung toward each or away from each other, depending upon the direction in which the rock-shaft g is rocked. When the frame j is lowered so as to rest upon the alley floor 13, the only part of the apparatus besides the frame which touches the alley floor is the cushion d of the foot c of actuator a . The latter is pushed upwardly by its contact with the floor and thereby swings the rocker-arm e and oscillates the rock-shaft g . The turning of the rock-shaft g forces each finger 12 against its adjacent swinging arm z , whereby the cup-members x' are made to take the position indicated by the full lines in Fig. 3. The pins are now dropped into the holes u and are held in position by the sides x' of the pin-holders x . When the frame is raised from the floor, the coil-springs r , r' pull the operating-bars o , p in the opposite direction, whereby the fingers 12 are withdrawn from the arms z and the cup-members or sides x' drop by gravity, allowing the pin to slip to the floor and the frame to pass over the upper part of the pin. It will be observed that a very fine and accurate adjustment of the parts may be obtained so that the apparatus will work with great nicety, a very desirable feature.

The portions j^* of the sides of the frame j are perpendicular to the base end s of the

frame; and this construction is made possible by the arrangement of the mechanism carried within the frame. The advantage of the arrangement of the side portions j^* is that the corners at the base end being rectangular and not oblique-angled, these corners do not project over into the gutters 14 (Fig. 7) of the alley; hence, the spotter may be lowered to the floor of the alley without first clearing the gutters of any pins lying therein. The cross-bar 5 adjacent to the base-end s is supported and guided by the angle-brackets 15, 16, the brackets 15 being fastened to the base-end and the brackets 16 being fastened to the lower face of the top j'' .

In Fig. 7 is shown an apparatus for raising and lowering the spotter. From the floor 13 of the alley rises on each side thereof a post or standard 17 and the top of these posts 17 are joined by a cross-piece 18. The latter supports a pair of tubular guides 19 upon the upper ends of which are mounted pulleys 20. In the lower ends of the tubular guides 19 work telescopically the upright bars 21 to the upper ends of which are fastened cords 22 which pass over the pulleys 20 and from which are suspended the counterweights 23. The lower ends of the upright bars 21 are anchored in ring-shaped brackets 24 fastened to the sides of the frame j (Fig. 1).

Since only a single actuator is used in my new spotter and since this actuator is the only part of the operating mechanism which touches the alley-floor, the wear upon the latter is minimized. Again, since the actuator is the only part which comes in contact with the alley-floor, the other parts need not be made of wood, as is usual in order to reduce wear upon the floor, but may be made of metal, whereby the durability of the spotter is greatly increased without incurring danger of wearing holes in the alley-floor. Again, the metal pin-holding parts in my new spotter are not subjected to wear by coming in contact with the alley-floor and, therefore, retain their accuracy of fit about the pin and do not allow the latter to shift. The pin-holding cup-members fall away from the pins by gravity, when the spotter is raised; and this arrangement of parts does away with the use of a large number of small springs, simplifies the construction, reduces the first cost and the cost of maintenance, upkeep and repair and makes the spotter more certain in its action and more quickly responsive in operation. If the cup-members x' are too low, they may be readily raised upon the arms z . Again, the holding position and the releasing position of these cup-members may be accurately adjusted by moving the hangers y in which are pivoted the arms z . The position of the fingers 12 projecting from the slides 11 and actuating

the arms z may be adjusted to a nicety by moving these slides 11.

I do not claim as part of my invention the particular form of raising-and-lowering apparatus shown in Fig. 7; and, indeed, any suitable apparatus for this purpose may be used with my new spotter.

I claim:

1. A bowling-pin spotter having a frame; pin-holding devices carried thereby; operating mechanism for controlling the position of said devices; and an actuator which is connected with said mechanism and one end of which projects normally below the plane of the bottom of said frame, when the latter is out of contact with the alley floor.

2. A bowling-pin spotter having a frame; pin holding devices carried thereby; spring-controlled operating mechanism for controlling the position of said devices; and an actuator which is connected with said mechanism and one end of which projects normally below the plane of the bottom of said frame, when the latter is out of contact with the alley floor.

3. A bowling-pin spotter having a frame; pin-holding devices carried thereby; bars for controlling the position of said devices; and an actuator which is connected with said bars and one end of which projects normally below the plane of the bottom of said frame, when the latter is out of contact with the alley floor.

4. A bowling-pin spotter having a frame; pin-holding devices carried thereby; spring-controlled bars for controlling the position of said devices; and an actuator which is connected with said bars and one end of which projects normally below the plane of the bottom of said frame, when the latter is out of contact with the alley floor.

5. A bowling-pin spotter having a frame formed with holes for the reception of the pins; two-part pin-holding devices for gripping the pins and holding the latter against shifting; a pair of main operating-bars

cross-bars carried by the latter and provided with adjustable plates arranged in close proximity to said devices; and mechanism for moving said main operating-bars.

6. A bowling-pin spotter having a frame formed with holes for the reception of the pins; two-part pin-holding devices the parts of which are mounted free to swing away from each other and from the pins under the influence of gravity; main operating-bars cross-bars carried by the latter and arranged in close proximity to said devices; and an actuator which is connected with said main operating-bars and one end of which projects normally below the plane of the bottom of said frame, when said devices are in releasing position.

7. A bowling-pin spotter having a frame formed with holes for the reception of the pins; two-part pin-holding devices mounted free to swing in close proximity to the edges of said holes; bars for controlling the position of said devices; and an actuator which is connected with said bars and which normally projects below the plane of the bottom of said frame, when the latter is raised from the alley floor.

8. A bowling-pin spotter having a frame formed with holes for the reception of the pins; two-part pin-holding devices mounted free to swing in close proximity to the edges of said holes; spring-controlled bars for controlling the position of said devices; and an actuator which is connected with said bars and which normally projects below the plane of the bottom of said frame, when the latter is raised from the alley floor.

In testimony whereof I hereunto set my hand at Beloit, Wisconsin, in the presence of the two undersigned witnesses this 26th day of February, 1910.

FRANK HUGHES.

Witnesses:

CLARA BAUKUE,
H. W. ADAMS.