

No. 858,229.

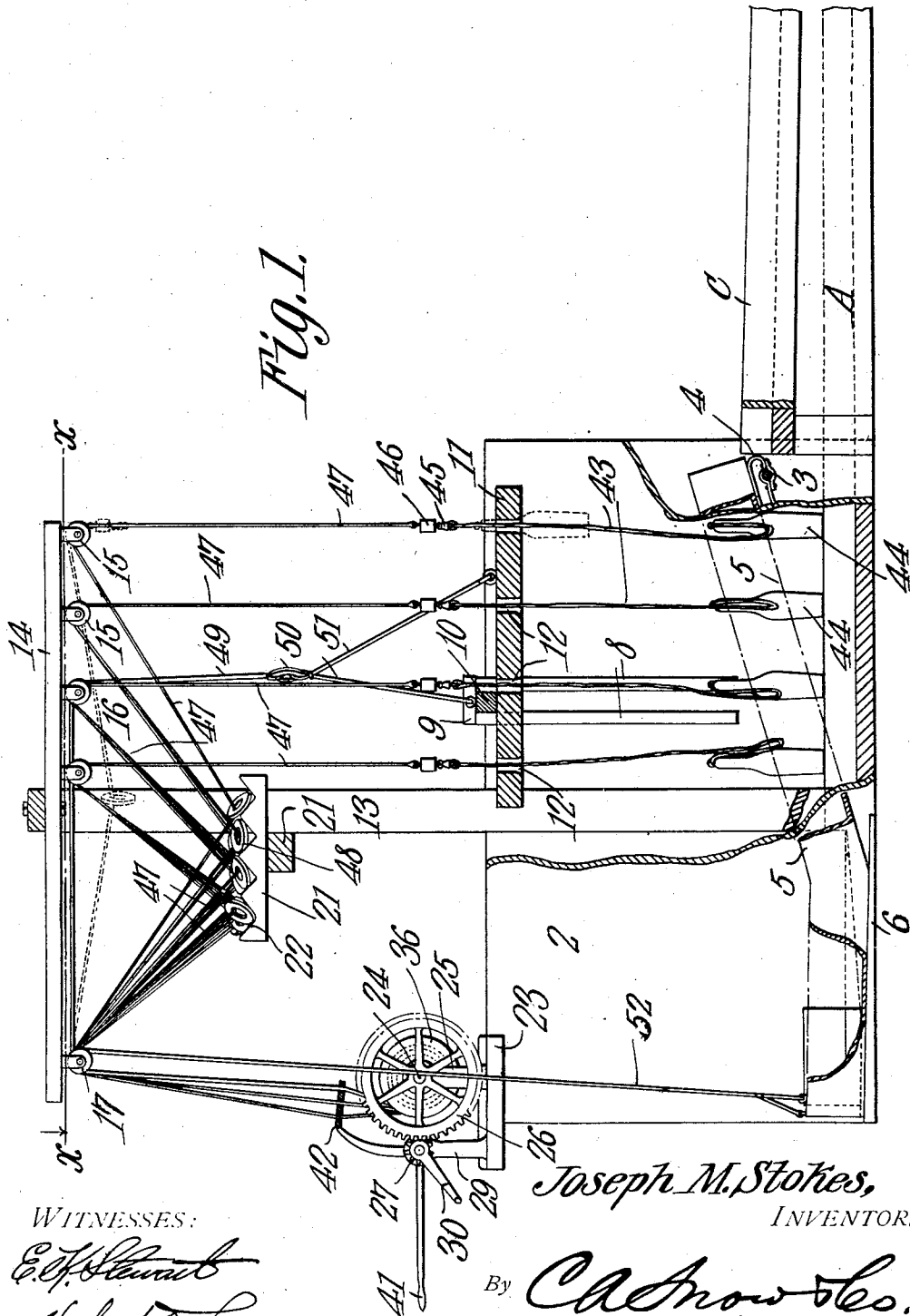
PATENTED JUNE 25, 1907.

J. M. STOKES.

BOWLING PIN SETTING APPARATUS.

APPLICATION FILED FEB. 28, 1907.

2 SHEETS—SHEET 1.



WITNESSES:

E. F. Stewart
Robert D. Lawson

Joseph M. Stokes,
INVENTOR.

By *C. A. Snow & Co.*
ATTORNEYS

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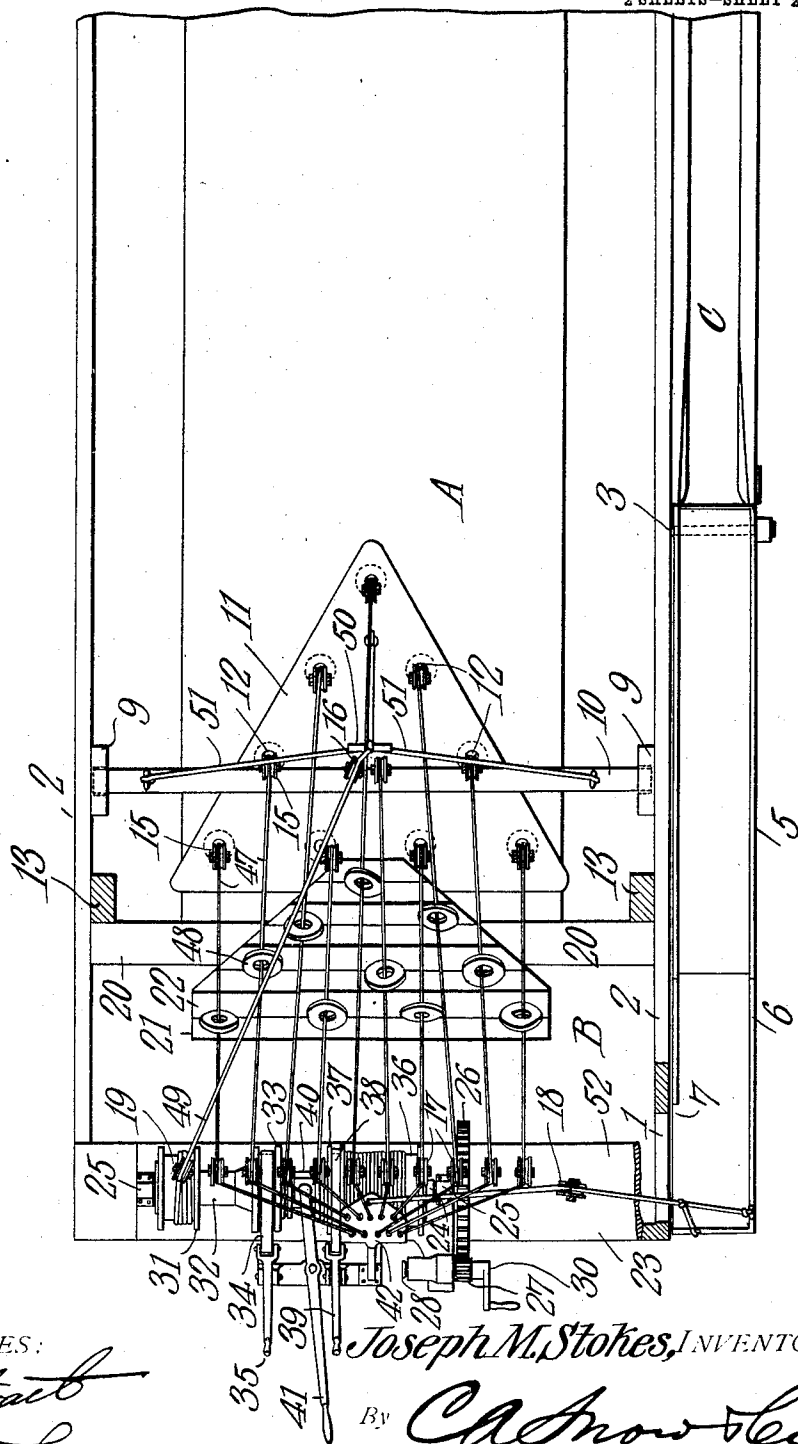
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2 SHEETS—SHEET 2.

Fig. 2.



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Joseph M. Stokes, INVENTOR.

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UNITED STATES PATENT OFFICE.

JOSEPH M. STOKES, OF OKEENE, OKLAHOMA TERRITORY.

BOWLING-PIN-SETTING APPARATUS.

No. 858,229.

Specification of Letters Patent.

Patented June 25, 1907.

Application filed February 28, 1907. Serial No. 359,777.

To all whom it may concern:

Be it known that I, JOSEPH M. STOKES, a citizen of the United States, residing at Okeene, in the county of Blaine and Territory of Oklahoma, have invented a new and useful Bowling-Pin-Setting Apparatus, of which the following is a specification.

This invention relates to apparatus for setting pins of bowling alleys and the like and its object is to simplify and improve upon the construction of apparatus of this character heretofore devised.

Another object is to provide means whereby one or more of the pins can be knocked over in the usual manner after which all of the pins can be returned to their proper positions upon the alley without necessitating the attendance of a person within the pit of the alley for "spotting" or arranging the pins.

A still further object is to provide a gutter attachment whereby the balls can be directed to the front end of the alley after each person has bowled.

Another object is to provide means whereby any one of the pins can be set up independently of the others should it be so desired.

Another object is to provide means whereby the pin lifting devices are held taut for the greater portion of their lengths but are maintained normally slack adjacent the pins so as not to interfere with the overturning of them.

With these and other objects in view the invention consists of certain novel features of construction and combinations of parts which will be hereinafter more fully described and pointed out in the claims.

In the accompanying drawings is shown the preferred form of the invention.

In said drawings: Figure 1 is a view partly in section and partly in side elevation of the complete apparatus; and Fig. 2 is a section on line $x-x$, Fig. 1.

Referring to the figures by characters of reference, A is a bowling alley of the usual construction with the exception that the floor of the pit B is inclined so as to direct balls toward one of the rear corners of the pit and through an opening 1 formed in the wall 2 thereof. The gutter C terminates at a point in front of the opening 1 and pivotally mounted adjacent the end of the gutter upon a supporting pin 3 is a bowed spring 4 secured to the outlet end of a trough 5. The rear end portion of this trough is normally horizontal as shown at 6 in Fig. 1 and has an opening in the inner side wall which normally registers

with the outlet opening 1. The trough 5 is provided with means which will be hereinafter described whereby the rear end portion thereof can be raised a sufficient distance to direct into the gutter C any balls which may be contained within the trough. The side walls 2 of the pit extend to opposite sides of the rear portion of the alley A and have oppositely disposed pairs of guide cleats 8 connected at their upper ends by caps 9 which constitute stops. Slidably mounted between these guide cleats are the end portions of a cross strip 10 which is secured upon and extends transversely of a setting frame 11 preferably triangular. This frame has openings 12 therein arranged at the same distances apart and in the same relation to one another as are the bowling pins when properly set up on the alley. The openings are of sufficient size to receive the necks of the pins and the lower ends of said openings are slightly flared so as to permit the upper ends of the pins to easily enter them. The setting frame is disposed at all times directly above the points where the pins are to be set up. This frame is provided with simple means for raising and lowering it and which will be hereinafter set forth.

Standards 13 extend above side walls 2 and support a top 14 to the lower surface of which are connected small pulleys 15 arranged in the same relation to one another as the openings 12. In other words, one of these pulleys is located directly above each of the openings 12. As there are ten of these openings there are therefore ten pulleys disposed above them and an additional pulley 16 located above the center of the frame 11. Ten other pulleys 17 are disposed in alignment adjacent the rear end of the top 14 and a pulley 18 is suspended from the top adjacent one of the end pulleys 17 while a pulley 19 is suspended from the top adjacent the other end pulley 17. A cross beam 20 is connected to the standards 13 at a point below the top 14 and supports a rack 21 having parallel grooves 22 extending from side to side thereof. Preferably four of these grooves are employed.

Supported by the rear portions of the walls 2 is a shelf 23 having a shaft 24 journaled thereabove in standards 25. A gear 26 is secured to one end of this shaft and meshes with a small drive gear 27 secured to a shaft 28 journaled in a standard 29. This shaft has a crank 30 whereby it can be readily ro-

tated manually although it is to be understood that if preferred a motor may be utilized for driving the shaft 28. A drum 31 is loosely mounted on the shaft 24 and is connected by a sleeve 32 with a brake wheel 33. This wheel is surrounded by a band 34 designed to be operated by a lever 35 whereby the drum can be held against rotation when the same is not locked to the shaft 24. Another drum 36 is loosely mounted on the shaft 24 and is provided at one end with a brake wheel 37 surrounded by a band 38 which is connected to an actuating lever 39. By means of this lever the drum 36 can be held against movement when not locked to the shaft 24. A clutch member 40 is keyed or otherwise suitably connected to the shaft 24 between the drum 36 and the brake wheel 13 and is adapted to be shifted by a lever 41 against either of the brake wheels 33 and 37 so as to lock their respective drums to the shaft and cause them to rotate therewith. A guide plate 42 is suitably supported above the drum 36 and has openings therein equal in number to the pulleys 17 and 18.

Extending through each of the openings 12 in the setting frame 11 is a cord 43 the lower end of which is fastened to the upper end of a pin 44. Each of the cords 43 is detachably fastened, as by means of a snap hook 45, with a small weight 46. Each of these weights is suspended by a cord 47 from one of the pulleys 15 and said cords 47 pass from the pulleys 15 and above the rack 21 over the pulleys 17. These pulleys support the cords above the drum 36 and the end portions of the cords pass downward through the openings in guide plate 42 and are fastened to the drum 36. A small weight 48 preferably in the form of a ring is loosely mounted upon each of the cords 47 at a point between its two pulleys 15 and 17 and these weights normally rest by gravity upon the rack 21. The grooves 22 are so positioned within the rack that the weights on the cords of the four back pins 44 will rest in the rear groove 22, the weights of the three pins in next to the last row will rest in the next groove, etc. It is thought that this has been clearly indicated in the drawings. A cord 49 is supported by the pulleys 16 and 19 and is fastened at one end to the drum 31 while its other end is connected by a ring 50 to preferably three cords 51 one of which is fastened to the frame 11 adjacent its front end while the other cords 51 are secured to the end portions of the cross strip 10. Another cord 52 is supported by the pulley 18 and is fastened at one end to the rear end portion of trough 5, while its other end extends through one of the openings in the guide plate 42 and is fastened to the drum 36.

The normal position of the frame 11 is indicated in Fig. 1 and the same is supported by the cord 49 which is prevented from un-

winding from the drum 31 by the band brake 34. The weights 46 permit sufficient slack in the cords 43 to allow the pins to fall over and roll predetermined distances upon the alley. When it is desired to set up the pins the clutch 40 is drawn into engagement with drum 36 and by rotating the gears 27 and 26 the drum will wind the cords 47 and 52 thereon. This will cause the pins 44 to be thrown upward so that the necks thereof will become seated within the openings 12, as shown by dotted lines in Fig. 1. The weights 48 will also be raised as shown by dotted lines in said figure and the cords will therefore be held taut. At the same time the cord 52 will raise the trough 5 so that any balls therein will be directed into the gutter C. As soon as the pins have been raised into the frame 11 the rotation of shaft 24 is stopped and the two drums 31 and 36 are gradually released so that the weight of the frame 11 and of the pins 44 and weights 46 will cause the cords 47 and 49 to gradually unwind from the drums. The frame 11 and the pins will, therefore move downward until the pins rest upon the alley in their proper positions and after the weights 48 and 46 have unwound the cords 47 to their greatest extent the clutch 40 is placed in engagement with the brake wheel of drum 31 so as to cause the drum to wind the cord 49 thereon when shaft 24 is revolved. The frame 11 is thus lifted to the position shown in Fig. 11 where it is held by applying the brake band 34 to wheel 33. The pins 44, however, are left standing upon the alley and the weights 46 maintain the cords in a slack condition close to the pins so that the overturning of the pins will not be interfered with.

If preferred the cord 52 can be made slack so that the trough will not be raised until immediately prior to the placing of the pin within frame 11. This will give the last balls thrown time to roll into the trough without compelling the operator to delay raising the pins.

Although a solid frame 11 with ten openings has been shown, it is to be understood that the frame can be of any desired construction and any number of openings or arrangement thereof can be provided according to the game to be played.

Should it be desired to use only certain of the pins 44 the remaining pins can be readily removed by unfastening their strings 43 from the hooks 45. Should one or more of the pins fall over after the pins have been set up the same can be readily replaced simply by grasping the string connected to it and raising the pins to the frame 11. The pin can then be gradually lowered until it assumes an upright position. Should some of the cords 47 be stretched or for any other reason become longer than desirable, the weights 48 will take up the slack when the cords are

wound on drum 36 so that all the pins will be positively held against the frame 11 during the setting operation.

By providing apparatus such as herein described it becomes unnecessary for a person to enter the pit B at any time as the pins can all be manipulated by the cords extending from them. The apparatus can be readily connected to bowling alleys of the ordinary construction.

What is claimed is:

1. The combination with a setting frame having pin receiving openings; of a plurality of separate flexible lifting devices extending through the openings, a pin connected to each of said devices, a drum, means for rotating the drum to simultaneously actuate the lifting devices and center the pins within the openings, and means upon said devices for taking up slack during the centering operation.

2. The combination with a setting frame having pin receiving openings; of movably supported lifting devices extending through the openings, a pin at one end of each of said devices, an actuating device connected to the other end of said lifting devices, a weight upon each of the lifting devices to hold one end portion thereof normally slack, weights loosely mounted on the lifting devices for holding the remaining portions thereof normally taut, and a rack normally supporting the loosely mounted weights.

3. The combination with a vertically movable setting frame having pin receiving openings, and means for actuating the frame; of a plurality of separate flexible lifting de-

vices extending through the openings, means upon each of said devices for holding one end portion thereof normally slack, a pin connected to the slack portion of each lifting device, means for actuating the lifting devices to center the pins within the openings, and separate means upon the lifting devices for taking up slack during the centering operation.

4. The combination with a rotatable element, winding devices mounted thereon, and means for locking said devices to the element; of a setting frame having a plurality of pin receiving openings, a flexible actuating device connected to the frame and one of the winding devices, a plurality of flexible lifting devices secured to the other winding device and supported within the openings in the setting frame, and a pin connected to each of the lifting devices.

5. The combination with a setting frame having pin receiving openings; of a plurality of separate flexible lifting devices, a pin detachably connected to each of said devices, means for simultaneously actuating the lifting devices to direct the pins into the openings and separate means slidable upon the lifting devices for taking up slack therein while directing pins into the openings.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOSEPH M. STOKES.

Witnesses:

LEVI CRAMER,
H. A. HASTINGS.