

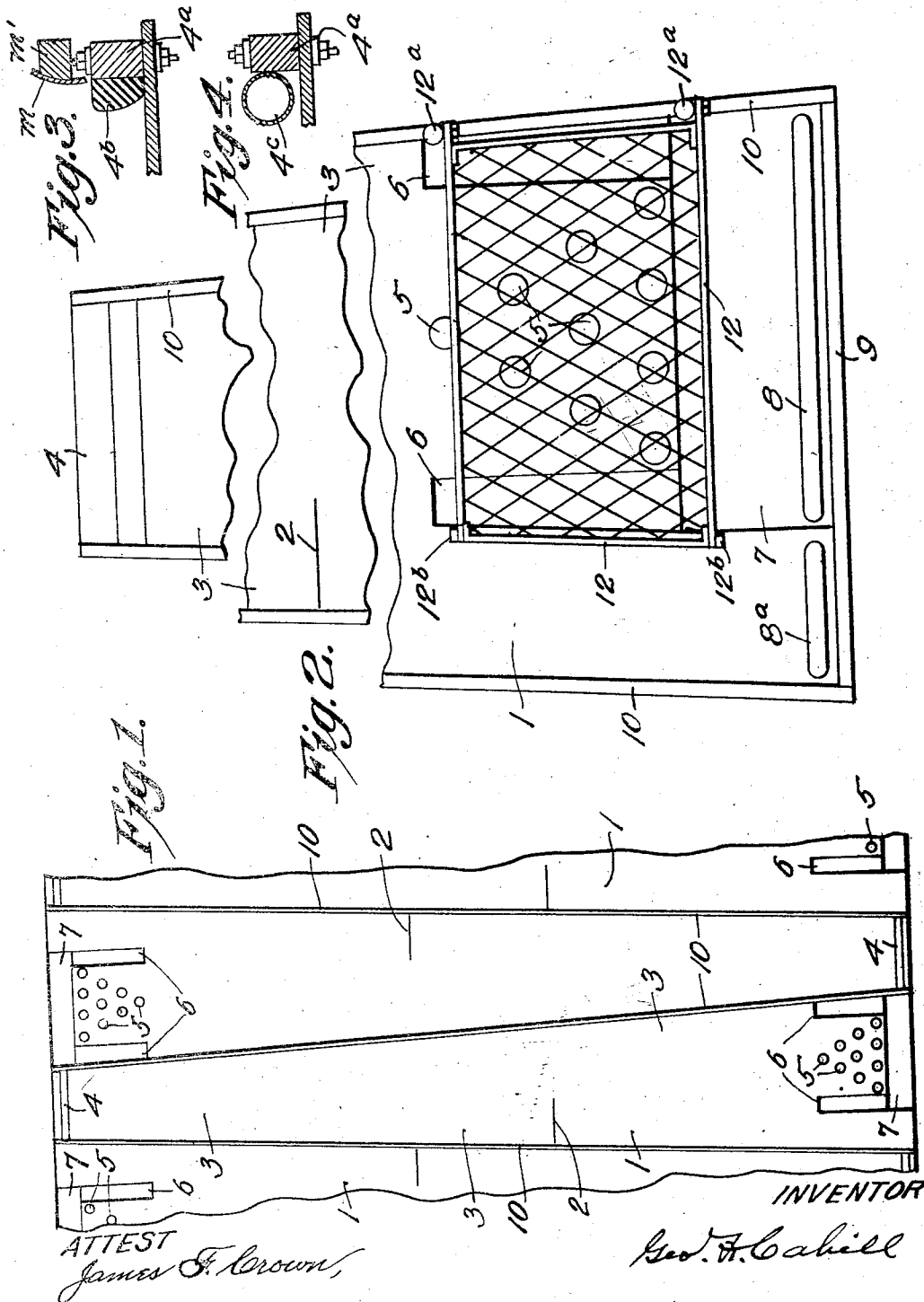
Jan. 12, 1926.

1,569,260

G. F. CAHILL

BOWLING ALLEY AND BOWLING APPARATUS

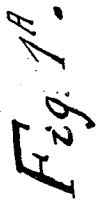
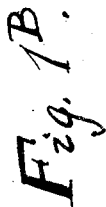
Original Filed Jan. 29, 1919 2 Sheets-Sheet 1



1,569,260

BOWLING ALLEY AND BOWLING APPARATUS

2 Sheets-Sheet 2



Attest:
Pharrell Cahill



INVENTOR

Geo. F. Cahill

UNITED STATES PATENT OFFICE.

GEORGE F. CAHILL, OF NEW YORK, N. Y.

BOWLING ALLEY AND BOWLING APPARATUS.

Application filed January 29, 1919, Serial No. 273,778. Renewed June 6, 1925.

To all whom it may concern:

Be it known that I, GEORGE F. CAHILL, a citizen of the United States, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Bowling Alleys and Bowling Apparatus, of which the following is a specification.

The principal object of my invention is to produce a bowling alley, or structure, on which games similar in many respects to the games of ten-pins, duck-pins, candle-pins, etc., can be played, but of less length, and requiring a lesser number of square feet of floor space than the standard bowling alleys now in use. Bowling alleys for the game of ten-pins, as generally constructed in this country, require a minimum floor space 83 feet in length and 11 feet, 6 inches in width, for two alleys, or five feet 9 inches for each alley, although a single alley requires a somewhat greater width, about 6 feet 3½ inches. By the invention herein disclosed, a bowling alley may be constructed of just about half this length and of an average width of about 5 to 6 or 6¼ feet, but in order to reduce the width in this way, I make my alley relatively wide at one end and relatively narrow at the other end. Or, taking a greater space for the purpose, I make my alley with parallel or nearly parallel sides, so that it is full width for the whole length and I use the one arrangement or the other according to the circumstances of the case, using the former arrangement with the alley wide at one end and narrow at the other, preferably, in those cases in which it is most important to economize space.

A further object of my invention is to so organize and construct pairs or groups of alleys, that the wide end of one shall be abreast the narrow end of another, so that the width of floor space occupied by two alleys shall be equal only to the sum of the average widths of the two alleys and not to the aggregate widths of the wider ends.

Another object of my invention is to make it possible for a player, when he desires, to set up the pins for himself without the necessity of walking from one end of the alley to the other for that purpose.

A further object of my invention is to speed up the game, by eliminating the time now lost in waiting for the return of his

ball to a player who desires to use the same ball all the time.

In my system, the player rolls the ball against a reflecting surface, from which it is thrown back towards the pins. And a further object of my invention is to heighten the interest in the game and to simplify the mental calculation involved in determining the point of the rebounding surface at which the ball is to be aimed in order that it may rebound against the pin or pins which are to be knocked over. I accomplish this by placing a mirror above, or in a suitable position of proximity to, the rebounding surface, in which mirror the player sees the image of the pin or pins to be bowled over.

A further object of my invention is to protect player and spectators, in view of the fact that they are at the pin-end of the alley, from flying pins.

In the accompanying drawings, in which corresponding parts are indicated by similar reference characters—

Fig. 1 is an outline or diagrammatic drawing, in plan, of a plurality of my bowling alleys, illustrating the preferred construction, in which the narrow end of one alley and the wide end of the next alley alternate;

Fig. 1^A is a detail, a plan view of the playing-end of one of the alleys shown in Fig. 1;

Fig. 1^B is also a detail view, a longitudinal section through a portion of one of the playing alleys at the playing end thereof, the plane of section passing through the pin-space, the pit and the swinging cushion 8, substantially parallel to the length of the alley, the pins not being shown.

Fig. 2 is a somewhat similar view, on an enlarged scale, of a single alley, parts being broken away in order to get the view on to the sheet. This view shows also a guard or netting to prevent pins flying too far off the alley;

Fig. 3 is a detail view of a cross-section, showing one type of rebounding means, showing also a mirror above said rebounding means;

Fig. 4 is a cross-section of a somewhat similar rebounding means with an inflated pneumatic tube or cushion in place of the rubber cushion shown in Fig. 3;

Fig. 5 is a detail of a longitudinal section through the pin space and pit at the head of the alley.

Referring especially to Figs. 1 and 2—

1 is the run-way or space on which the player stands or moves when delivering the ball; 2 is the foul line, beyond which he should not pass; 3 is the alley proper, extending from the foul line to the rebounding surface, 4, and from said rebounding surface back to the space occupied by the pins, 5, 5. 6, 6, are gutters or troughs and 7 is the pit. 8 is the swinging cushion (not shown in Fig. 1) or motion absorbing device which serves to receive the impact of the reflected ball and to protect the wall or rear face 9 of the pit 7. 8^a is another swinging curtain or other suitable deadening device, across the back of the run-way 1, to stop any wild balls which, returning from the rebounding surface, roll on to the run-way 1, instead of on to the space occupied by the pins 5, 5. 10, 10, are low partitions, walls or rebounding surfaces, to separate the alleys and to prevent the ball from rolling off of the playing surface. 11, 11, are somewhat higher partitions, or "kick-backs," possibly 18 inches high, to prevent the pins from flying off sideways. 12 is a frame covered with netting, to prevent pins from flying into the air and away from the alleys. As illustrated in Fig. 2, this frame is so constructed as to take the place of the partitions or kick-backs 11, 11. Pivoted on up-rights 12^a, 12^a, it lies across and above the pins, the left-hand end being supported on up-rights 12^b, 12^b; the netting extends from the floor or low partition, 10, on the right-hand side, up to the movable top, across said movable top and down on the left-hand side to the floor. When it is desired to set up the pins, the left-hand end of the frame, 12, is raised on its pivots at the right-hand side into an upright position, giving free access to the pin space. The mesh of the netting may be sufficiently large to permit the hand of a player to reach therethrough to remove "dead wood" from the alley, without necessitating the raising of the net bodily. The mesh should not, however, be large enough to permit a pin to fly through it under the impact of a fast ball. Another form of protecting device is shown in, and will be described in connection, with Fig. 5.

When the ball is delivered by the player, it travels down the alley until it strikes the rebounding surface, 4, which is substantially at right angles to the length or axis of the alley, from which it rebounds back along the alley toward the space occupied by the pins 5, 5. Any suitable form of rebounding device may be used. Several constructions are shown in the drawings by way of illustration of this part of my invention. In Fig. 3, a construction is shown which consists of a heavy beam or other device, 4^a, of suitable size and mass, and so firmly bolted or fastened to the floor as to

form a sufficiently firm and permanent resistance to the impact of the ball. To the face of said impact-resisting mass, 4^a, is attached a resilient body, 4^b, of rubber or other suitable substance, formed in any suitable manner, against which the ball impinges. In the construction of Fig. 4, a hollow and inflated tube, 4^c, held in place by the cross bar 4^a or other suitable pneumatic device, receives the impact of the ball instead of the rubber or other resilient substance of Fig. 3.

Near the center and the left of Fig. 5 is illustrated one form of guard, partition or kick-back, 11, to prevent the pins, 5, from being knocked side-wise onto the run-way 1, or onto the adjoining alley. In the construction shown, the guard 11 on the side toward the player, does not extend to the back wall, but is cut off somewhat back of the pin-space to permit easy access from the run-way to the pit, for the purpose of removing "dead wood" and setting up the pins. The corresponding guard 11 on the other side should generally extend back to the rear end of the pit. Also a type of cover or guard to prevent pins from flying into the air or injuring the players or spectators is shown. A frame for holding netting is composed of the bars, *g*, *g*, which pass across the pin-space and gutters of the alley and the end-pieces *h*, *h*, of which only one is seen in Fig. 5. The frame formed by the cross-bars *g*, *g*, and end-pieces *h*, *h*, aforesaid, is carried on links or arms *i*, *i*, and *k*, *k*, pivoted at the fixed centers *l*, *l*, only one of each being shown in the drawing. When the pins have been set up, the frame occupies substantially the position shown in Fig. 5 with the bars *k*, *k*, resting down upon the stops *k'*, *k'*. When, however, it is desired to set up the pins, the frame may be bodily tilted forward until the bars *i*, *i*, rest down upon the stops *i'*, *i'*, when the back cross-bar, *g*, will be sufficiently elevated and forward to permit easy access to the pin-space.

I have described in this specification and illustrated in the drawing the peculiar features of my invention, which otherwise preferably is of approved construction in accordance with the best practice in the art. Known and approved details of construction, especially for the under frame work, which are commonly used, I have not, in general, endeavored to illustrate in the drawing or describe in the specification, since they are already well known in the art.

From a playing standpoint, the greatest difference between a game of ten-pins, as played on the customary form of bowling alley and upon my improved form of bowling alley herein described, is that on the old form of alley, the player, when delivering the ball, sees and aims directly at the pin

or pins he wishes to bowl over, while on the type of alley herein described, the pins are frequently backward from the player when he delivers the ball and the ball is aimed at a surface lying across the alley from which it is to rebound to the pin or pins. The mental action is, of course, somewhat different, involving, on the type of alley herein described, a mental calculation as to angles and the exact spot on the rebounding surface at which the ball should be aimed. To somewhat reduce this mental calculation and to give the player the feeling of aiming directly at the pins, I place a mirror or other suitable reflecting surface, m , (see Fig. 3) supported in any suitable manner, as, for instance, by a cross-bar, m' , across the alley and preferably in substantially the same plane as the rebounding surface, but preferably at a sufficient height above the floor of the alley-way to prevent the ball from ever striking it. Theoretically, the angle of incidence and the angle of reflection for the mirror and for the rebounding surface should be the same. While in actual practice, they are probably not absolutely identical, the mirror does serve to simplify the mental calculation and to give the player the sense of aiming directly at the pin or pins which he wishes to displace.

In place of the mirror, which, of course, may be omitted, when desired, vertical lines may be drawn across the rebounding surface, or other suitable marks or indications placed thereupon, or on a board or other suitable surface above or in proximity to the rebounding surface, as a help to the player in determining what point of the rebounding surface should be aimed at, in order that the ball may roll from the rebounding surface to the pin or pins desired. Further, a mark or marks for a right-hand player, and another mark or marks for a left-hand player, may be placed upon the alley itself at or near the foul line, and corresponding marks or indications placed upon the rebounding surface or over the rebounding surface, to indicate that a ball thrown from a certain mark on the foul line against the corresponding mark on the rebounding surface will rebound normally to a certain pin or pins. If desired, a line may be drawn from the run-way or foul-line down the alley-way to the rebounding surface and back to any pin or other position to indicate that a ball rolled from the run-way down that line to the rebounding surface will normally rebound along the other line to the point indicated. For instance, a red line might be used for a right-handed player and a yellow line, for a left-handed player, and lines may be drawn from a given starting point to more than one position on the pin-space, if desired.

Where in this specification, and especially

in the statement of claim at the end hereof, I use the word "cushion", shock absorbing cushion or other similar expression, I wish it to be distinctly understood that I mean to include any suitable form of cushion whether movable or stationary, whether of elastic material such as rubber, leather chips, etc.; whether pneumatic or whether made of springs, etc.

Where in this specification, and especially in the statement of claim at the end hereof, I use the words "a playing surface on which a ball may be rolled from one end of the alley towards the other end of the same," or other similar words, I wish it to be understood that the ball is not necessarily rolled from the extreme end but rather that the movement of the player and the ball commence from one end or near one end although the ball may actually be delivered from the hand of the player a considerable distance from the starting end. In fact, the foul line as shown upon Figs. 1 and 2, and as actually placed in practice is a considerable distance toward the middle of the alley lengthwise.

The partitions or walls 11, 11, Figs. 1, 1^A and 5, called "kick-backs", because they serve to prevent the pins from being knocked too far from the pin-space and by their resilience throw them back on to the pin-space and so tend to knock down other pins, are located outside the gutters 6, 6.

In order to permit the player to pass easily from the runway 1, into the pit 7, to set up the pins, I provide a convenient passage or entrance, preferably at the rear of the kick-back 11, that lies next to the player's runway 1, through which passage or entrance the player can conveniently pass from the runway down into the pit, to set up the pins.

And when I speak in this specification and particularly in the statement of claim at the end hereof, of a passage for the player, by which he may freely pass from the run-way to the pit or use other similar words or language of similar import, I refer by the word passage, or entrance, whichever may be used, to the passage, entrance or entry-way, through which the player conveniently passes from his runway into the pit; such, for example, as that shown in Figs. 1, 1^A, 1^B and 5, at the rear of the kick-back 11, that is proximate to the player's runway.

In some passages in this specification and in the statement of claim at the end hereof, I speak of a ball-reflecting device and in others, of a rebounding means, against which the ball strikes and by which it is thrown back towards the pin-space, or use other expressions of similar import. By the ball-reflecting device or the ball-rebounding means, or other similar words, I refer to

the thing, which performs the function of throwing the ball back—of reflecting it or causing it to rebound—so that it travels backwards towards the pin-space. Various forms of device may be used for this purpose. Thus, for example, I may use a cushion of soft, elastic rubber or other suitable substance, such as the cushion, 4^b, seen in Fig. 3; or I may use an inflated pneumatic tube, such as the tube 4^c, seen in Fig. 4; or I may use any suitable arrangement of springs, or any other resilient device whatever that is suitable for the purpose may be used.

In various places in the specification and in the statement of claim at the end hereof, I speak of a cushion or motion-absorbing device or shock-absorbing device, which serves (however the fact may be expressed) to arrest the ball after it falls into the pit. One convenient arrangement for this purpose is the swinging cushion, 8, seen in Figs. 1^A, 1^B, 2 and 5 of the drawings. The swinging cushion or bumper 8 is ordinarily made as a wooden frame, with a wooden back and a filling of hair, excelsior or other resilient material, faced with leather or cloth, the whole being hung or suspended by screw eyes or rings 8^a from hooks 8^b, 8^c. But any other form or arrangement of cushion or bumper, or any other mounting therefor, that is suitable for the purpose, may, of course, be used instead of that shown in the drawings. This device has the merit not only of having a certain amount of elasticity to suppress the noise made by the ball and pins when they strike it, but by its weight it absorbs the movement of the ball and so brings it quietly and speedily to rest. But any other form of cushion (whether mounted on a swinging frame or not) or any other form of motion-absorbing device or shock-absorbing device that is suitable for the purpose, may be used instead.

When in this specification, or in the statement of claim at the end hereof, I speak of "the rebounding surface, 4, which is substantially at right angles to the length or axis of the alley," I wish it to be understood that I mean that the rebounding surface is to be at such an angle that when the ball is rolled from the players' runway down against the rebounding surface, it will return across the pin space at the opposite end of the alley. That is, approximately at right angles to what I call the axis of the alley, that is, a line midway between a line passing from the point on the foul line where the ball is commonly delivered to approximately the center of the rebounding surface and a line from that point back to the head pin.

When in this specification, or in the statement of claim at the end hereof I speak of a "pneumatic tube or cushion" or of "a hol-

low and inflated tube, 4^c," I mean to include not only rubber or other air-tight substance for retaining the air but also (conformably to the common practice of protecting such rubber tube with a tube of textile material, leather, etc.) a protecting tube of leather, cotton, linen, or other suitable flexible material which prevents the internal pressure from unduly expanding the rubber or other air container. Also, when I use the words "rebounding means", "rebounding surface", "rebounding device", "ball reflecting device", "pneumatic cushion" or "inflated pneumatic cushion", as an element of a claim, or use other similar expressions, I mean not only any suitable air-containing and air-restraining substance or substances but also any suitable solid substance or substances such, for instance, as the part 4, to hold the pneumatic part in place and to maintain the surface which is struck by the ball in the predetermined position to cause said ball to rebound correctly from said rebounding device.

What, therefore, I claim as my invention and desire to secure by Letters Patent, is—

1. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface that is approximately level on which a ball may be rolled from one end of the alley towards the other end of the same; the playing surface of said alley also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin space for the pins, located beside the runway aforesaid, and at substantially the same level; (c) a ball reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin space; and (d) a pit, back of the pin space aforesaid; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball reflecting means aforesaid will roll backwards on said alley across the pin space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

2. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface that is approximately level on which a ball may be rolled from one end of the alley towards the other end of the same; the playing surface of said alley also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin space, for the pins, located beside the runway aforesaid, and at substantially the same level; (c) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the

ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin space; (d) a pit, back of the pin space aforesaid; and (e) a cushion at the back of said pit, serving to arrest the ball; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball reflecting means aforesaid will roll backwards on said alley across the pin space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the run-way aforesaid.

3. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface that is approximately level on which a ball may be rolled from one end of the alley towards the other end of the same; the playing surface of said alley also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin space for the pins, located in proximity to the runway aforesaid, and at substantially the same level; (c) an inflated pneumatic cushion, located at the opposite end of the alley from the pin-space aforesaid, against which cushion the ball strikes when thrown by the player and by which said ball is thrown back towards the pin space; and (d) a pit, back of the pin-space aforesaid; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the pneumatic cushion aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit; said pit being located in proximity to the starting end of the runway aforesaid.

4. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface that is approximately level on which a ball may be rolled from one end of the alley towards the other end of the same; the playing surface of said alley also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin space for the pins, located in proximity to the runway aforesaid, and at substantially the same level; (c) an inflated pneumatic cushion, located at the opposite end of the alley from the pin-space aforesaid, against which cushion the ball strikes when thrown by the player and by which said ball is thrown back towards the pin space; (d) a pit, back of the pin-space aforesaid; and (e) a cushion at the back of said pit, serving to arrest the ball; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the pneumatic cushion aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit; said pit being located in proximity to the starting end of the runway aforesaid.

5. An improved bowling alley, as herein-

before described, having, in combination, (a) a playing surface that is approximately level on which a ball may be rolled from one end of the alley towards the other end of the same; the playing surface of said alley also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin space for the pins, located in proximity to the runway aforesaid, and at substantially the same level; (c) a pneumatic cushion, located at the opposite end of the alley from the pin-space aforesaid, against which cushion the ball strikes when thrown by the player and by which said ball is thrown back towards the pin space; said pneumatic cushion having an inner air-tight lining of soft rubber and a strong tubular surrounding covering; and (d) a pit, back of the pin-space aforesaid; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the pneumatic-cushion aforesaid, will roll backwards on said alley across the pin-space aforesaid into the pit; said pit being located in proximity to the starting end of the runway aforesaid.

6. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface that is approximately level on which a ball may be rolled from one end of the alley towards the other end of the same; the playing surface of said alley also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin-space for the pins, located in proximity to the runway aforesaid, and at substantially the same level; (c) a pneumatic cushion, located at the opposite end of the alley from the pin-space aforesaid, against which cushion the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; said pneumatic cushion having an inner air-tight lining of soft rubber and a strong tubular surrounding covering; (d) a pit, back of the pin space aforesaid; and (e) a cushion at the back of said pit, serving to arrest the ball; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the pneumatic-cushion aforesaid, will roll backwards on said alley across the pin-space aforesaid into the pit; said pit being located in proximity to the start-end of the runway aforesaid.

7. An improved bowling alley, as hereinbefore described having, in combination, (a) a playing surface that is approximately level on which a ball may be rolled from one end of the alley towards the other end of the same; the playing surface of said alley also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin-space for the pins, located beside the runway aforesaid, and at sub-

stantially the same level; (c) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; the bowling alley aforesaid being made broad at the end where the pins and player's runway are located, and narrow at the ball-reflecting end; and (d) a pit, back of the pin-space aforesaid; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

8. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface that is approximately level on which a ball may be rolled from one end of the alley towards the other end of the same; the playing surface of said alley also including a runway or space for the player on which he stands or runs when throwing the ball (b) a pin-space for the pins, located beside the runway aforesaid, and at substantially the same level; (c) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; the bowling alley aforesaid being made broad at the end where the pins and player's runway are located and narrow at the ball-reflecting end; (d) a pit, back of the pin-space aforesaid; and (e) a cushion at the back of said pit; serving to arrest the ball; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

9. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface on which a ball may be rolled from one end of the alley towards the other end of the same; said playing surface also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin space for the pins, located in proximity to the runway aforesaid; (c) a ball reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin space; (d) a kick-back on each side of the pin-space aforesaid; (e) a pit, back of the pin-space

aforesaid; and (f) a passage located to the rear of one of the kick-backs aforesaid from the player's runway into the pit aforesaid, through which passage the player can conveniently pass from his runway into the pit, in order to set up the pins; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

10. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface on which a ball may be rolled from one end of the alley towards the other end of the same; said playing surface also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin space for the pins, located in proximity to the runway aforesaid; (c) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin space; (d) a kick-back on each side the pin-space aforesaid; (e) a pit, back of the pin space aforesaid; (f) a cushion at the back of said pit, serving to arrest the ball; and (g) a passage located to the rear of one of the kick-backs aforesaid, from the player's runway into the pit aforesaid, through which passage the player can conveniently pass from his runway into the pit, in order to set up the pins; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

11. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface on which a ball may be rolled from one end of the alley towards the other end of the same; said playing surface also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin space for the pins, located in proximity to the runway aforesaid; (c) an inflated pneumatic cushion, located at the opposite end of the alley from the pin-space aforesaid, against which cushion the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; (d) a kick-back on each side of the pin-space aforesaid; (e) a pit, back of the pin-space aforesaid; and (f) a passage, located to the rear of one of the kick-backs aforesaid from the player's runway into the pit aforesaid, through which passage the player can con-

veniently pass from his runway into the pit, in order to set up the pins; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

12. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface on which a ball may be rolled from one end of the alley towards the other end of the same; the playing surface of said alley also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin-space for the pins, located beside the runway aforesaid, and at substantially the same level; (c) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back toward the pin-space; the bowling alley aforesaid being made broad at the end where the pins and player's runway are located, and narrow at the ball-reflecting end; (d) a kick-back on each side of the pin-space aforesaid; (e) a pit, back of the pin-space aforesaid; and (f) a passage located to the rear of one of the kick-backs aforesaid, through which passage the player can conveniently pass from his runway into the pit in order to set up the pins; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

13. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface on which a ball may be rolled from one end of the alley towards the other end of the same; the playing surface of said alley also including a runway or space for the player on which he stands or runs when throwing the ball (b) a pin-space for the pins, located beside the runway aforesaid, and at substantially the same level; (c) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back toward the pin-space; the bowling alley aforesaid being made broad at the end where the pins and player's runway are located and narrow at the ball-reflecting end; (d) a kick back on each side of the pin-space aforesaid; (e) a pit, back of the pin-space aforesaid; and (f) a cushion at the

back of said pit, serving to arrest the ball; and (g) a passage located to the rear of one of the kick-backs aforesaid from the player's runway into the pit aforesaid, through which passage the player can conveniently pass from his runway into the pit, in order to set up the pins; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

14. An improved bowling alley, as hereinbefore described, having, in combination, (a) a playing surface on which a ball may be rolled from one end of the alley towards the other end of the same; said playing surface also including a runway or space for the player on which he stands or runs when throwing the ball; (b) a pin-space, for the pins located in proximity to the runway aforesaid; (c) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; (e) a pit, back of the pin-space aforesaid; (f) a kick-back on each side of the pin-space aforesaid; (g) a passage, located to the rear of one of the kick-backs aforesaid, from the player's runway into the pit aforesaid, through which passage a player can conveniently pass from his runway into the pit, in order to set up the pins; and (h) a gutter on each side of the pin-space aforesaid; said gutters, at the pin end of the alley being inside the kick-backs aforesaid and at least one of the gutters, namely, the gutter on the side next to the player's runway, being cut short so that the space which it would occupy if it were extended toward the ball-reflecting end of the alley forms part of the runway; the whole being so constructed and arranged that a ball, rolled from the runway aforesaid against the ball-reflecting means aforesaid, will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

15. An improved bowling alley, having (a) a playing surface, which is broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball, and a pin-space for the pins, located beside the runway aforesaid; and (b) a ball-reflecting device, at the opposite end of the alley from

- the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player, and by which device said ball is thrown back towards the pin-space; the whole being so constructed and arranged that a ball, rolled from the runway aforesaid against the ball-reflecting means aforesaid, will roll backwards on said alley across the pin-space aforesaid.
16. An improved bowling alley, having (a) a playing surface, which is broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball, and a pin-space for the pins, located beside the runway aforesaid; (b) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; and (c) a pit, back of the pin-space aforesaid; the whole being so constructed and arranged that a ball, rolled from the runway aforesaid against the ball-reflecting means aforesaid, will roll backwards on said alley, across the pin-space aforesaid, into the pit aforesaid; said pit being located in proximity to the starting-end of the runway aforesaid.
17. An improved bowling alley, having (a) a playing surface, which is broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball, and a pin-space for the pins, located beside the runway aforesaid; (b) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; (c) a pit, back of the pin-space aforesaid; and (d) a cushion at the back of said pit, serving to arrest the ball; the whole being so constructed and arranged that a ball, rolled from the runway aforesaid against the ball-reflecting means aforesaid, will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.
18. An improved bowling alley, having (a) a playing surface, which is broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball, and a pin-space for the pins located in proximity to the runway aforesaid; (b) an inflated pneumatic cushion, located at the opposite end of the alley from the pin-space aforesaid, against which cushion the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; and (c) a pit, back of the pin-space aforesaid; the whole being so constructed and arranged that a ball, rolled from the runway aforesaid against the pneumatic cushion aforesaid, will roll backwards on said alley across the pin-space aforesaid into the pit; said pit being located in proximity to the starting-end of the runway aforesaid.
19. An improved bowling alley, having (a) a playing surface, which is broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball; and a pin-space for the pins, located in proximity to the runway aforesaid; (b) an inflated pneumatic cushion, located at the opposite end of the alley from the pin-space aforesaid, against which cushion the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; (c) a pit, back of the pin-space aforesaid; and (d) a cushion at the back of said pit, serving to arrest the ball; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the pneumatic cushion aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit; said pit being located in proximity to the starting end of the runway aforesaid.
20. In a bowling alley, the combination of a playing surface, broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player, on which he stands or moves when delivering the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid for the player and at about the same level; gutters formed in said playing surface on each side of said pin-space; a rebounding means across the narrow end of the playing surface aforesaid, against which the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; a pit, back of said pin-space

and gutters; and a shock-absorbing device at the back of said pit; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the rebounding means aforesaid, will roll backwards on said alley, across the pin-space aforesaid and into said pit, where it will be in proximity to the starting end of the runway.

21. In a bowling alley, the combination of a playing surface, broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball; a mark on said bowling alley to indicate the forward limit of movement that is allowed to the player when he throws the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid, for the player and at about the same level; gutters formed in said playing surface on each side of said pin-space; a rebounding means across the narrow end of the playing surface aforesaid, against which the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; a pit, back of said pin-space and gutters; and a shock-absorbing device at the back of said pit; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the rebounding surface aforesaid will roll backwards on said alley, across the pin-space aforesaid and into said pit, where it will be in close proximity to the starting end of the runway.

22. In a bowling alley, the combination of a playing surface which is broad at one end and narrow at the other end, on which surface a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid for the player and at about the same level; gutters formed in the playing surface aforesaid on each side of the pin-space aforesaid; a rebounding means across the narrow end of said playing surface, against which the ball strikes, when thrown by the player and by which said ball is thrown back towards the pin-space; a pit, back of said pin-space and gutters; and means serving to prevent the pins from being knocked onto the player's runway aforesaid.

23. In a bowling alley, the combination of a playing surface which is broad at one

end and narrow at the other end, on which surface a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball; a mark on said bowling alley to indicate the forward limit of movement that is allowed to the player when he throws the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid for the player and at about the same level; gutters formed in the playing surface aforesaid on each side of the pin-space aforesaid; a rebounding means across the narrow end of said playing surface, against which the ball strikes, when thrown by the player and by which said ball is thrown back towards the pin-space; a pit, back of said pin-space and gutters; and means serving to prevent the pins from being knocked onto the player's runway aforesaid.

24. In a bowling alley, the combination of a playing surface which is broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves, when delivering the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid for the player and at about the same level; gutters formed in the playing surface aforesaid on each side of the pin-space aforesaid; a rebounding means across the narrow end of said playing surface, against which the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; a pit, back of the pin-space and gutters; a shock-absorbing device at the back of said pit; and means serving to prevent the pins from being knocked onto the player's runway aforesaid; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the rebounding surface aforesaid will roll backwards on said alley across the pin-space aforesaid and into the pit, where it will be in proximity to the starting end of the runway.

25. In a bowling alley, the combination of a playing surface, broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves, when delivering the ball; a mark on said bowling alley to indicate the forward limit of movement that is allowed to the

player when he throws the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid for the player and at about the same level; gutters formed in the playing surface aforesaid on each side of the pin-space aforesaid; a rebounding means across the narrow end of said playing surface, against which the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; pins on the pin-space aforesaid; a pit, back of said pin-space and gutters; a shock-absorbing device at the back of said pit; and means serving to prevent the pins from being knocked onto the player's runway aforesaid; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the rebounding surface aforesaid, will roll backwards on said alley, across the pin-space aforesaid and into the pit, where it will be in proximity to the starting end of the runway.

26. In a bowling alley, the combination of a playing surface, on which a ball may be rolled from the one end to the other end against a rebounding surface and thence back to the end from which it started, the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid for the player and at about the same level; gutters formed in the playing surface aforesaid on each side of said pin-space; a rebounding means, disposed across the end of said playing surface that is remote from the player, against which rebounding means the ball strikes, when thrown by the player and by which the ball is thrown back towards the pin-space; a pit, back of said pin-space and gutters; and a shock-absorbing device at the back of said pit; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against said rebounding surface will roll backwards on said alley across the pin-space aforesaid and into said pit, where it will be in proximity to the starting end of the runway; and a passage for the player, by which he may pass freely from the runway to the pit aforesaid, for the purpose of setting up the pins.

27. In a bowling alley, the combination of a playing surface on which a ball may be rolled from the one end to the other end against a rebounding surface and thence back to the end from which it started, the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball; a mark on said bowling alley to indicate the forward limit of movement that is allowed to the player when he throws the ball; a pin-space for the pins,

said pin-space being located in proximity to the runway aforesaid for the player and at about the same level; gutters formed in the playing surface aforesaid on each side of said pin-space; a rebounding means disposed across the end of said playing surface that is remote from the player, against which rebounding means the ball strikes when thrown by the player and by which it is thrown back towards the pin-space; a pit, back of said pin-space and gutters; and a shock-absorbing device at the back of said pit; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against said rebounding surface will roll backwards on said alley across the pin-space aforesaid and into said pit, where it will be in proximity to the starting end of the runway; and a passage for the player, by which he may pass freely from the runway to the pit aforesaid, for the purpose of setting up the pins.

28. An organization of two or more bowling alleys, said alleys each including, in combination, a playing surface broad, at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface, and thence back to the broad end; the two bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the other alley, each of said bowling alleys having also (a) a pin-space for the pins, located beside the runway aforesaid; and (b) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin-space aforesaid.

29. An organization of two or more bowling alleys, said alleys each including, in combination, a playing surface, broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface, and thence back to the broad end; the two bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the other alley, each of said bowling alleys having also (a) a pin-space for the pins, located beside the runway aforesaid; (b) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; and (c) a pit, back of the pin-space aforesaid; the whole being so con-

structed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid, will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting-end of the runway aforesaid.

30. An organization of two or more bowling alleys, said alleys each including, in combination, a playing surface broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface, and thence back to the broad end; the two bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the other alley, each of said bowling alleys having also (a) a pin-space for the pins, located beside the runway aforesaid; (b) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; (c) a pit, back of the pin-space aforesaid; and (d) a cushion at the back of said pit, serving to arrest the ball; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

31. An organization of two or more bowling alleys, said alleys each including, in combination, a playing surface broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface, and thence back to the broad end; the two bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the other alley, each of said bowling alleys having also (a) a pin-space for the pins, located in proximity to the runway aforesaid; (b) an inflated pneumatic cushion, located at the opposite end of the alley from the pin-space aforesaid, against which cushion the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; and (c) a pit, back of the pin-space aforesaid; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the pneumatic cushion aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit; said pit being located in proximity to the runway aforesaid.

32. An organization of two or more bowling alleys, said alleys each including, in combination, a playing surface broad at one end and narrow at the other end, on which

a ball may be rolled from the broad end to the narrow end, against a rebounding surface, and thence back to the broad end; the two bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the other alley, each of said bowling alleys having also (a) a pin-space for the pins, located in proximity to the runway aforesaid; (b) an inflated pneumatic cushion, located at the opposite end of the alley from the pin-space aforesaid, against which cushion the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; (c) a pit, back of the pin-space aforesaid; and (d) a cushion at the back of said pit, serving to arrest the ball; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the pneumatic cushion aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit; said pit being located in proximity to the starting end of the runway aforesaid.

33. An organization of two or more bowling alleys, including, in each, the combination of a playing surface, board at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface of each of the bowling alleys aforesaid including a runway for the player on which he can move when delivering the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid for the player; gutters formed in said playing surface on each side of said pin-space; a rebounding surface, disposed across the narrow end of said playing surface, against which the ball strikes when thrown by the player and by which it is thrown back towards the pin-space; a pit, back of the pin-space and gutters aforesaid; a shock-absorbing device at the back of said pit; the whole being so constructed and arranged that a ball, rolled from the runway aforesaid against the rebounding surface aforesaid will roll backwards on said alley, across the pin-space aforesaid and into said pit, where it will be in proximity to the starting end of the runway; the two bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the adjacent alley.

34. An organization of two or more bowling alleys, including in each, the combination of a playing surface, broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface and thence back to the broad end; the playing surface of each of the bowling alleys aforesaid including a runway for the player on which he can move when delivering the ball;

a mark on said bowling alley to indicate the forward limit of movement that is allowed to the player when throwing the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid for the player; gutters formed in said playing surface on each side of said pin-space; a rebounding surface, disposed across the narrow end of said playing surface, against which the ball strikes, when thrown by the player and by which it is thrown back towards the pin-space; a pit, back of the pin-space and gutters aforesaid; a shock-absorbing device at the back of said pit; the whole being so constructed and arranged that a ball, rolled from the runway aforesaid against the rebounding surface aforesaid will roll backwards on said alley, across the pin-space aforesaid and into said pit, where it will be in proximity to the starting-end of the runway; the two bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the adjacent alley.

35. An organization of two or more bowling alleys, said alleys each including, in combination, a playing surface, broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface, and thence back to the broad end; the two bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the other alley, each of said bowling alleys having also (a) a pin-space for the pins, located beside the runway aforesaid; (b) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; and (c) a passage or entrance into the pit from the runway aforesaid, from which the player can conveniently pass from the runway into the pit when he wishes to set up the pins; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin-space aforesaid.

36. An organization of two or more bowling alleys, said alleys each including, in combination, a playing surface, broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface, and thence back to the broad end; the two bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the other alley, each of said bowling alleys having also (a) a pin-space for the pins, located beside the runway aforesaid; (b) a ball-reflecting de-

vice, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; (c) a pit, back of the pin-space aforesaid; and (d) a passage or entrance into the pit from the runway aforesaid, through which the player can conveniently pass from the runway into the pit when he wishes to set up the pins; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid, will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting-end of the runway aforesaid.

37. An organization of two or more bowling alleys, said alleys each including, in combination, a playing surface broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface, and thence back to the broad end; the two bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the other alley, each of said bowling alleys having also (a) a pin-space for the pins, located beside the runway aforesaid; (b) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin-space; (c) a pit, back of the pin-space aforesaid; (d) a cushion at the back of said pit, serving to arrest the ball; and (e) a passage or entrance into the pit from the runway aforesaid, through which the player can conveniently pass from the runway into the pit when he wishes to set up the pins; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting means aforesaid will roll backwards on said alley across the pin-space aforesaid into the pit aforesaid; said pit being located in proximity to the starting end of the runway aforesaid.

38. An organization of two or more bowling alleys, including in each, the combination of a playing surface, broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end against a rebounding surface and thence back to the broad end; the playing surface of each of the bowling alleys aforesaid including a runway for the player on which he stands or moves when delivering the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid for the player; gutters formed in said playing surface on each side

of said pin-space; a rebounding surface, disposed across the narrow end of said playing surface, against which the ball strikes when thrown by the player and by which it is thrown back towards the pin-space; a pit, back of the pin-space and gutters aforesaid; and a shock-absorbing device at the back of said pit; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the rebounding surface aforesaid will roll backwards on said alley across the pin-space aforesaid and into said pit, where it will be in proximity to the starting end of the runway; and a passage for the player by which he may pass freely from the runway aforesaid to the pit aforesaid, for the purpose of setting up the pins; the bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the adjacent alley.

39. An organization of two or more bowling alleys, including in each, the combination of a playing surface, broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end against a rebounding surface and thence back to the broad end; the playing surface of each of the bowling alleys aforesaid including a runway for the player on which he stands or moves when delivering the ball; a mark or marks on or in proximity to said playing surface, to indicate the forward limit of movement that is allowed to the player, when he throws the ball; a pin-space for the pins, said pin-space being located in proximity to the runway aforesaid for the player; gutters formed in said playing surface on each side of said pin-space; a rebounding surface, disposed across the narrow end of said playing surface, against which the ball strikes when thrown by the player and by which it is thrown back towards the pin-space; a pit, back of the pin-space and gutters aforesaid; and a shock-absorbing device at the back of said pit; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the rebounding surface aforesaid will roll backwards on said alley across the pin-space aforesaid and into said pit, where it will be in proximity to the starting end of the runway; and a passage for the player by which he may pass freely from the runway aforesaid to the pit aforesaid, for the purpose of setting up the pins; the bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the adjacent alley.

40. An organization of two or more bowling alleys, including in each bowling alley, the combination of a playing surface, broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end against a rebounding surface and thence back to the

broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball; a pin-space for the pins in proximity to the runway aforesaid for the player; a rebounding surface across the narrow end of the playing surface aforesaid, against which the ball strikes when thrown by the player and by which said ball is thrown back towards the pin-space; a pit, back of said pin-space; a shock-absorbing device at the back of said pit; means serving to prevent the pins from being knocked sidewise from the pin-space on to the player's runway or on to the adjoining alley; the whole being so constructed and arranged that a ball which is rolled from the runway aforesaid against the rebounding surface aforesaid, will roll back on said alley across the pin-space aforesaid and into the pit aforesaid, where it will be in close proximity to the starting-end of the runway; and a passage for the player by which he may pass freely from the runway aforesaid to the pit aforesaid, for the purpose of setting up the pins; the bowling alleys aforesaid being built side by side, with the wide end of one alley next to the narrow end of the adjacent alley.

41. An improved bowling alley, having a playing surface, which is broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end against a rebounding surface and thence back to the broad end; the playing surface aforesaid also including a runway for the player on which he stands or moves when delivering the ball, and a pin space for the pins, located beside the runway aforesaid; a ball-reflecting device at the opposite end of the alley from the pins and runway aforesaid, against which ball reflecting device the ball strikes, when thrown by the player, and by which device said ball is thrown backward towards the pin space; the whole being so constructed and arranged that a ball, rolled from the runway aforesaid against the ball-reflecting device aforesaid, will roll backwards on said alley across the pin space aforesaid; and means for preventing pins from striking players, spectators or pin boy when said pins are struck by the ball.

42. An improved bowling alley, having a playing surface, which is broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end against a rebounding surface and thence back to the broad end; the playing surface also including a runway for the player on which he stands or moves while delivering the ball, and a pin-space for the pins, located beside the runway aforesaid; a ball-reflecting device at the opposite end of the alley from the pins

and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player, and by which device said ball is thrown back towards the pin space; the whole being so constructed and arranged that a ball, rolled from the runway aforesaid against the ball-reflecting device aforesaid, will roll backwards on said alley across the pin space aforesaid; and means for indicating the approximate part of the ball-reflecting surface which should be struck by the ball to cause it to return to any particular pin or pins.

43. An organization of two or more bowling alleys, said alleys each including, in combination, a playing surface broad at one end and narrow at the other end, on which a ball may be rolled from the broad end to the narrow end, against a rebounding surface, and thence back to the broad

end; the two bowling alleys aforesaid being built side by side, with the wide ends of the two alleys abreast; each of said bowling alleys having also (a) a pin space for the pins, located beside the runway aforesaid; and (b) a ball-reflecting device, at the opposite end of the alley from the pins and runway aforesaid, against which ball-reflecting device the ball strikes, when thrown by the player and by which device said ball is thrown back towards the pin space; the whole being so constructed and arranged that a ball rolled from the runway aforesaid against the ball-reflecting device aforesaid will roll backwards on said alley across the pin space aforesaid.

In testimony whereof, I have hereunto set my hand this 29th day of January, 1919, at Washington, in the District of Columbia.

GEO. F. CAHILL.