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P. L. BIBLE ET AL
BASEBALL THROWING MACHINE

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3 Sheets-Sheet 1

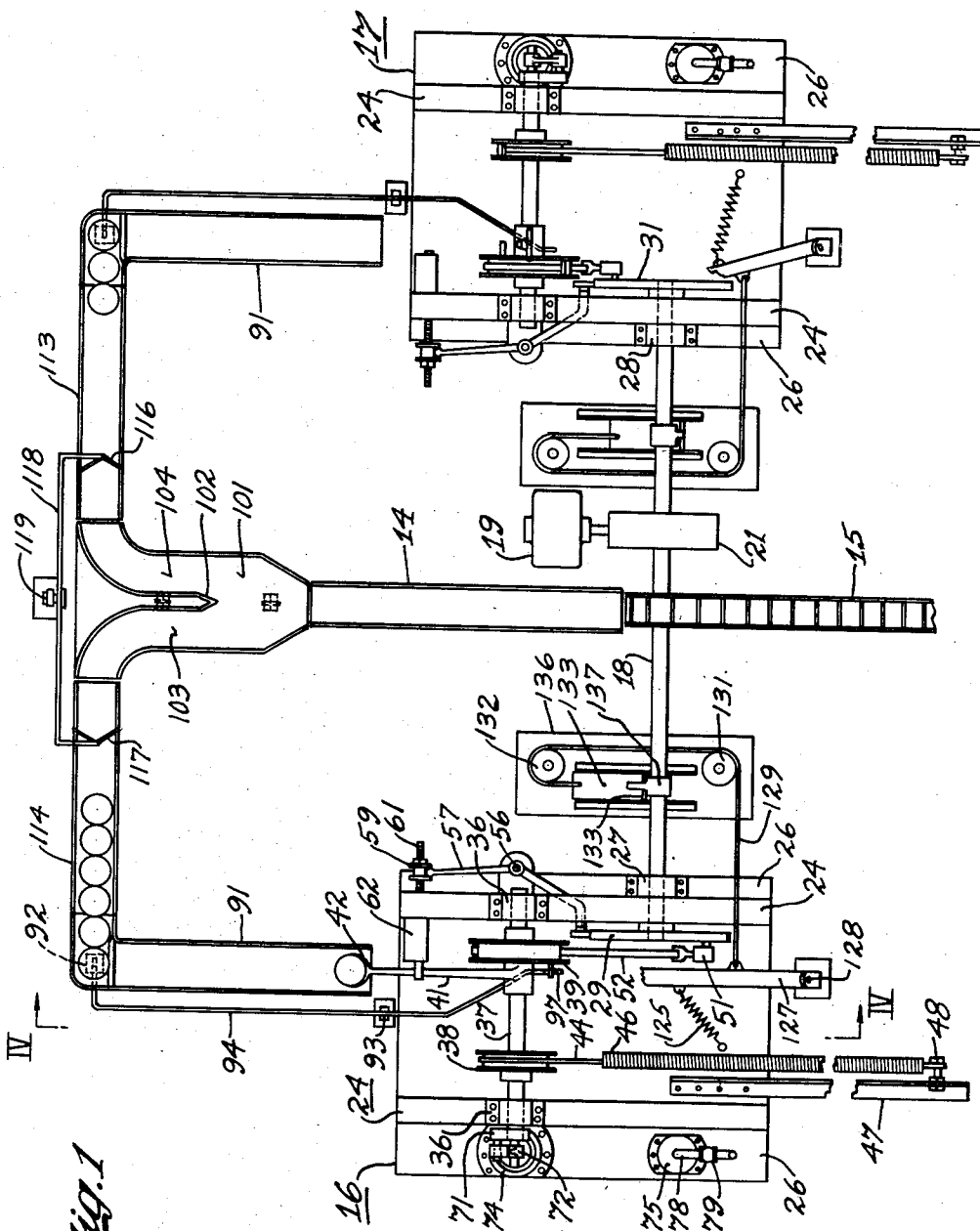


Fig. 1

Inventors
P. L. Bible
J. T. Thrasher
By Johnston & Jennings
Attorneys

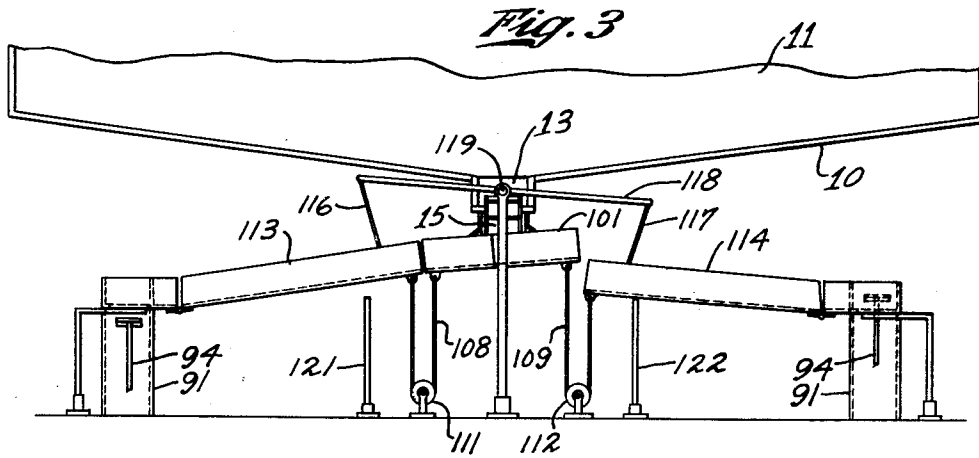
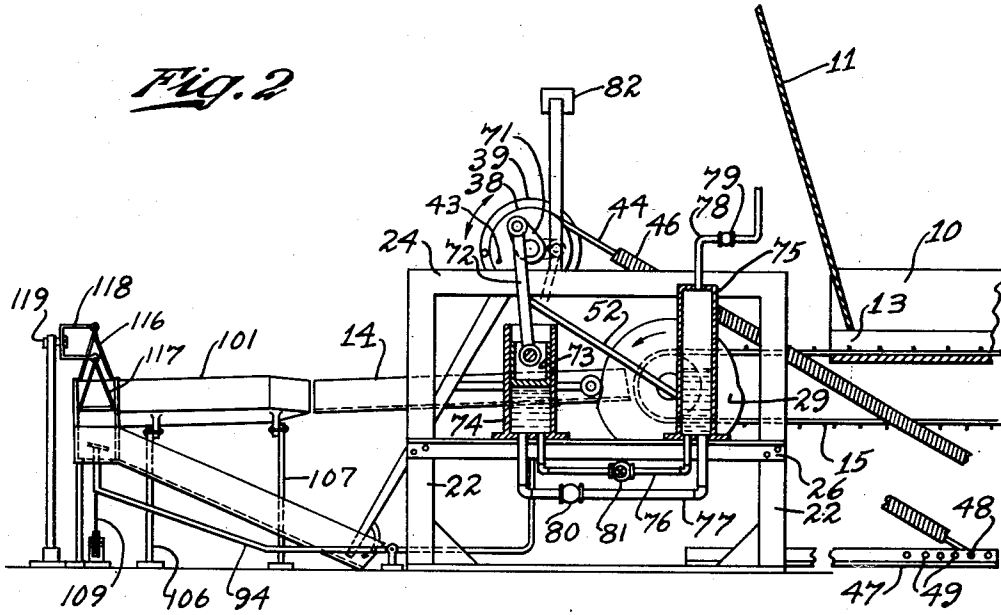
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Inventors
P. L. Bible
J. T. Thrasher
By *Johnston & Jennings* Attorneys

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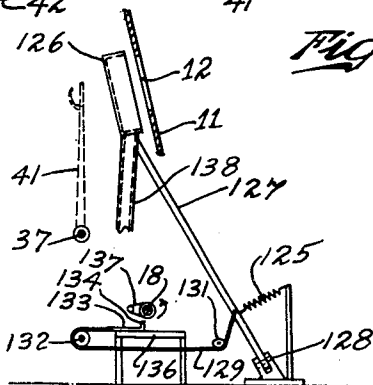
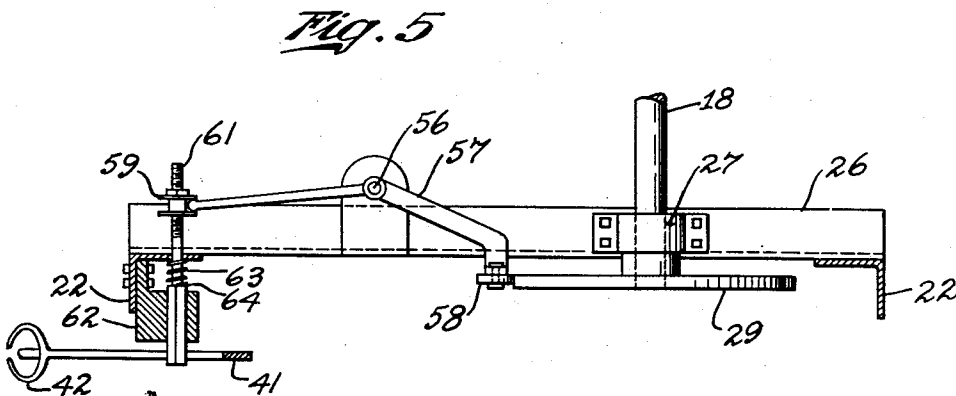
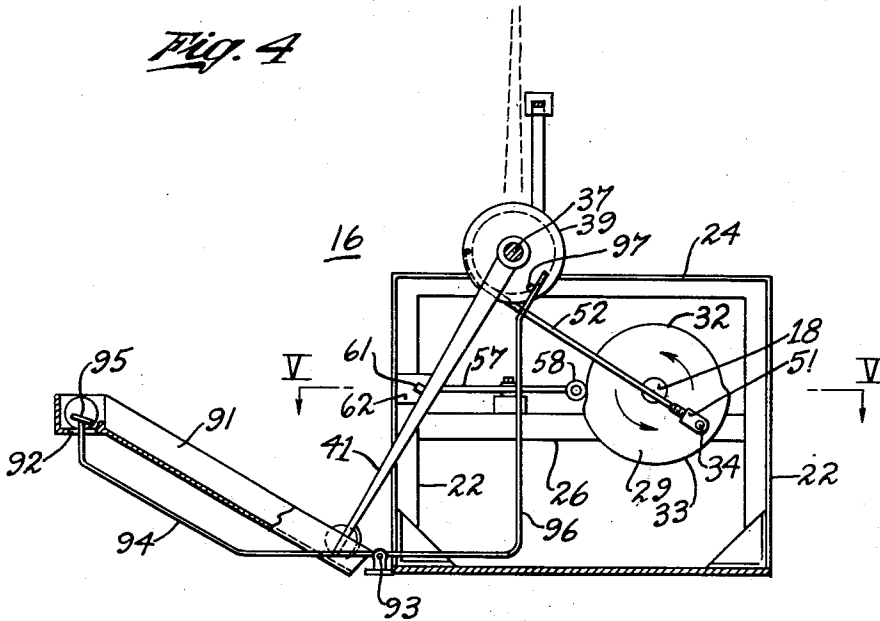
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BASEBALL THROWING MACHINE

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3 Sheets-Sheet 3



Inventors

P. L. Bible
J. T. Thrasher

By *Johnston & Jennings*
Attorneys

UNITED STATES PATENT OFFICE

PHILIP L. BIBLE, OF DALLAS, TEXAS, AND JOE T. THRASHER, OF BIRMINGHAM,
ALABAMA

BASEBALL-THROWING MACHINE

Application filed November 24, 1928. Serial No. 331,690.

Our invention relates to a machine for throwing base balls and has for its object the provision of apparatus of the character designated embodying a throwing arm and an adjustable relatively high powered means for actuating the throwing arm.

A further object of our invention is to provide a machine having two throwing arms which operate alternately to throw base balls to two batsmen and a novel means for returning, collecting and distributing thrown base balls to the two throwing arms.

Another object of our invention is to provide an improved means for drawing the throwing arm to its cocked position and novel improved means for holding said arm in that position until a ball has rolled down the chute and into position on the arm, after which the arm is automatically released.

A still further object of our invention is to provide a novel means which may be readily adjusted to increase or diminish the delivery speed of the base ball.

Another object of our invention is to provide a readily adjustable means to change the angle of delivery of a thrown ball, thereby affording a longer or shorter range of flight.

Another object of our invention is to provide a novel means for cushioning the movement of the throwing arm at the completion of the delivery stroke without subjecting the machine to excessive shock and strain.

Another object of our invention is to provide a novel means for catching and delivering to its proper chute any ball which may be hit back through the delivery opening in the back stop.

A further object of our invention is to provide a ball throwing machine which is comparatively inexpensive, simple in construction and will not readily get out of order.

Briefly, our invention comprises a pair of throwing machines together with a chute which guides base balls from the back stop to a distributing table and opposed chutes leading, one from each side of the table, to the throwing arms of the machine. The throwing arms are mounted on individual counter shafts and are drawn and held in

their delivery or cocked position and then released by means of a pair of cranks, one of which is mounted on each end of a main shaft which is driven by a motor through a gear box.

As the throwing arms are being drawn to their cocked position, a tension is automatically applied to heavy coil springs which are connected, at one end, to the frame of the machine and at their other ends to pulleys which are mounted on the countershafts carrying the said arms. After the release of the throwing arms, the coil spring will act to revolve the countershaft rapidly in the opposite direction to cocking, thereby pitching the ball to the batter. A hydraulic cushioning means is provided to retard and then stop the delivery action of the throwing arms.

A device embodying features of our invention is illustrated in the accompanying drawings, forming a part of this application, wherein

Fig. 1 is a plan view of the machine with the field removed;

Fig. 2 is an end elevation of the machine showing the cushioning cylinder and oil reservoir, partly in cross section;

Fig. 3 is a rear elevation of the distributing table and chutes and illustrates the manner in which the balls are collected and distributed to the desired chute;

Fig. 4 is a cross sectional view of the machine taken along the line IV—IV of Fig. 1;

Fig. 5 is an enlarged sectional view taken along the lines V—V of Fig. 4, and illustrating the means for holding and releasing the throwing arm; and

Fig. 6 is a diagrammatic view illustrating the means employed to catch any base ball which may be hit through the opening in the back stop.

Referring now to the drawings for a better understanding of our invention, we show a field 10 which slopes from the sides toward the center as is indicated in Figs. 2 and 3, so that thrown or batted balls alighting on the field roll toward the center. From this position, balls are returned to the pitching end of the field by a conveyer 15 to be redis-

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tributed in a manner to be hereinafter described.

At the front of the field is a net 11 for stopping batted balls and provided with an opening 12 through which the balls are thrown. The net 11 is also provided with an opening 13 opposite the lower central portion of the field 10 whereby balls alighting on the field and rolling down the lower central portion are carried through the opening 13 by the conveyer 15 into a chute 14 for delivery to the throwing machines in a manner to be later described.

We prefer to operate two similar throwing machines, which, for convenience, are arranged to throw balls alternately. The throwing machines comprise two similar units 16 and 17 operating from a common shaft 18 driven by a motor 19 through a gear box 21. Each of the throwing machines is comprised of a frame having upright corner members 22 and transverse members 24 and 26, joined to the corner members.

The shaft 18 is mounted in bearings 27 and 28 carried by the transverse members 26 of the machines 16 and 17. Mounted on the opposite ends of the shaft 18 are two cams 29 and 31 which rotate continuously with the shaft 18. Each of the cams has a depressed peripheral portion 32 and an enlarged peripheral portion 33, both of said peripheral portions comprising substantially 180° of the circumference of the cam, see Fig. 4. A crank pin 34 is carried by each of the cams 29 and 31, the two crank pins being arranged diametrically opposite each other with respect to the shaft 18.

Mounted on the transverse members 24 in bearings 36, is a countershaft 37 provided with pulleys 38 and 39. Secured to the pulley 39 is a throwing arm 41 provided with a ball grasping portion 42 such as is well known in the art.

Extending part way around the pulley 38 and secured thereto at 43 is a suitable flexible member 44, such as a chain, and which has secured thereto a heavy coil spring 46 having its other end anchored to an angle member 47 by means of a bolt 48. The angle member 47 is provided with a plurality of holes 49 whereby the initial tension of the spring 46 may be varied.

Secured to the crank pin 34 by means of a clevis 51 is a flexible member 52, such as a chain, and which has its opposite end extending part way round and secured to the pulley 39 at 53. The chain 52 extends around the pulley 53 in a direction opposite to the direction of the chain 44 around the pulley 38. The function of the chain 52 is to rotate the countershaft 37 in one direction, as the cam 29 rotates and thus place the spring 46 under tension. As the spring 46 is placed under tension, the throwing arm 41 is pulled downwardly to the position shown in Fig. 4. As

the cam 33 rotates further, the chain 52 slacks so that the spring 46, acting on the pulley 38, may rotate the shaft in the opposite direction and bring the throwing arm 41 to its upper dotted position, shown in Fig. 4.

In order that the stored up energy, caused by placing the spring 46 under tension, may be suddenly released to permit the arm 41 to fly quickly upward and throw a ball, I provide a cocking mechanism which will now be described. Pivotaly mounted on the frame of the machine at 56 is a lever 57 having mounted on one end thereof a roller 58 arranged to bear against the cam 29. The other end of the lever rests in a grooved collar 59 carried by a bolt 61 which is mounted to slide in a suitable bearing 62 secured to one of the upright members 22 of the frame of the machine adjacent the throwing arm 41. A spring 63 is arranged to bear against a shoulder 64 on the bolt 61 and against the frame member 22 so as to bias the bolt 61 to a position where it lies in the path of movement of the throwing arm 41. The spring 63 also insures that the roller 58 shall at all times be in contact with the surface of the cam 29.

It will be seen that as the cam 29 rotates, the roller 58 alternately rides on the depressed portion 32 and the enlarged portion 33 thereof, causing the lever 57 to alternately push the bolt 61 outwards, as seen in Fig. 5, out of the path of the arm 41, and permit the spring 63 to push the bolt 61 back in the path of the throwing arm 41. The positioning of the cam is such that when the arm 41 is being drawn downwards, the bolt 61 is out of the way of the arm 41 until the arm 41 has been pulled down as far as the chain 52 will pull it.

When this occurs, the roller 58 drops on the depressed portion 32 of the cam 29, permitting the spring 63 to move the bolt 61 over in a position to engage the arm 41. Upon further rotation of the cam 29, and when the pin 34 is in a position diametrically opposite to that shown in Fig. 4, with the chain slack, the roller 58 rides up on the enlarged portion 33 of the cam 29 pulling the bolt 61 out of the way of the arm 41 which permits the spring 46 to suddenly swing the arm upwards and throw a ball.

In order that the throwing arm, in terminating its upward swing, shall not come suddenly to rest by taking the slack out of the chain 52 and thus impose undue strain upon the machine, we provide a novel cushioning means for the apparatus which will now be described. Secured to the outer end of the shaft 37 is a crank 71 so located with respect to the throwing arm 41, as seen in Fig. 2, that when the throwing arm is at its lower position, the crank 71 is about 45° behind a vertical plane passing through the shaft 37. Secured to the crank 71 is a connecting rod 72 connected at its other end to a piston 73

reciprocable in a cylinder 74. Associated with the cylinder 74 is an oil reservoir 75 which is connected to the lower end of the cylinder 74 through conduits 76 and 77, the latter being relatively larger than the former.

At the top of the oil reservoir 75 is a breather pipe 78 which may be provided with an adjusting valve 79. The larger conduit 77 is provided with a check valve 80 which opens to permit oil from the reservoir 75 to flow freely into the cylinder 74 but which closes and does not permit oil to flow through said conduit from the cylinder 74 into the reservoir 75. The relatively smaller conduit 76 is provided with a valve 81 which provides a limited adjustable flow of oil in either direction between the cylinder 74 and reservoir 75.

With the throwing arm in its lower position as shown in Fig. 2, the piston 73 is near the upper end of the stroke and the rotation of the shaft 37 with the arm 41 moving swiftly to throw the ball, causes very slight movement of the piston 73 so that it imposes only slight resistance to the movement of the throwing arm. As the throwing arm approaches its upper position, however, the crank 71 moves round to the dotted position shown in Fig. 2, in which position the piston 73 is moving rapidly downward, driving the oil ahead of it out of the cylinder 74 through the small restricted conduit 76 and into the reservoir 75. The resistance to movement of the piston 73 at this point is sufficient to cushion the movement of the throwing arm 41 so that it comes to rest easily against a stop 82 arranged above the frame of the machine. As the throwing arm 41 is again pulled down to its lower position, the piston 73 moves upwards and the check valve 80 opens to permit free passage of oil from the reservoir 75 back into the cylinder 74.

Associated with each of the machines is a downwardly extending trough 91 terminating at the throwing arm when the throwing arm is in its lower position. The upper end of the trough 91 is provided with a hole 92 adapted to arrest and hold a base ball delivered to it in a manner to be described later. The balls delivered to the upper end of the trough 91 are in turn delivered to the throwing arm when in position to receive it in a manner now to be described, reference being had particularly to Fig. 4.

Pivotally supported at 93 is a lever 94 having one end 95 adapted to project up through the hole 92. The other end of the lever 94 extends forwardly and is provided with an upward bend 96 terminating adjacent the pulley 39. Carried by the pulley 39 is an axially extending pin 97 which engages the upper end of the portion 96 of the lever when the throwing arm 41 moves to its downward position, thereby depressing the forward end of the lever and raising the end

95 to push a ball out of the hole 92 whereupon it runs by gravity down the chute 91 to the ball grasping portion 42 of the throwing arm 41.

When the throwing arm moves upwardly, the end 95 of the lever 94 drops down out of the hole 92 permitting another ball to run into the hole 92 to be again delivered to the throwing arm when the throwing arm assumes the position shown in Fig. 4.

As will be seen in Fig. 2, the throwing machines are positioned below the field 10. This is important in that it permits the balls which have been thrown or batted to be collected on the field and returned selectively to the machines automatically and by gravity. Collected balls conveyed through the chute 14 pass onto a delivery table 101 which is divided by a V-shaped partition 102 to provide separate channels 103 and 104. The table 101 is pivotally supported centrally on the underside thereof by means of uprights 106 and 107 so as to be tiltable from side to side and has secured beneath it, at opposite ends thereof, ropes 108 and 109. The ropes 108 and 109 extend downwardly around pulleys 111 and 112 and then upwardly to be secured to troughs 113 and 114 respectively.

The troughs 113 and 114 are hinged at their outer ends to the troughs 91 and are supported at their inner ends by means of bails 116 and 117 secured to a lever 118 pivoted centrally thereof at 119. Arranged beneath the inner ends of the troughs 113 and 114 are uprights 121 and 122 which act as stops to limit the downward movement of the inner ends of the troughs.

With the arrangement just described, it will be seen that should either of the troughs 113 or 114 receive more balls than the other, the extra weight of the balls on such trough cause it to be depressed and acting through the lever 118, pulleys 111 and 112, and ropes 108 and 109 tilt the table 101 so that balls delivered to the table are caused to run by gravity toward the trough containing the lesser number of balls. By this means, balls collected on the field 10 return automatically by gravity back to the throwing machines and are evenly distributed to the two throwing machines without the interposition of any elevating or other mechanical means for handling the balls.

It will be understood that the balls which are being thrown to the machine are being batted back toward the machine by a batter located at some point ahead of the machine. It sometimes happens that a batted ball, instead of striking the netting 11, passes through the opening 12 and if unobstructed, might strike an attendant. In order to prevent such an occurrence, we provide a basket 126, see Figure 6, secured to an arm 127, which is pivoted at 128 to the frame of the machine. The arm 127 is biased by a spring

125 in a direction to swing the basket 126 to an upright position and close the opening 112.

5 Secured to the other side of the arm 127 is a rope 129 passing over pulleys 131 and 132 and having its other end secured to a slide 133 provided with an upstanding hook portion 134 on its outer end. The slide 133 is supported by a member 136 just beneath the shaft 18 and the shaft 18 is provided with a crank 137 so that at each revolution thereof 10 the crank 137 engages the hook 134 and pulls the arm 127 with the basket 126 away from the opening 12. When this occurs, the throwing arm 41 is moving to its upper position to deliver a ball through the opening 12. Immediately the throwing arm completes its upward movement, the crank 137 disengages from the hook 134 and the spring 128 pulls the arm 127 back in front of the opening 12. In event a batted ball passes through the opening 12 into the basket 126, it falls downwardly therefrom through a chute 138 onto the trough 14.

25 From the foregoing description, the operation of our improved apparatus will be readily understood. The motor 19 effects continuous rotation of the shaft 18 which rotates the cams 29, and 31. As the cams rotate, the chain 52 effects rotation of the countershaft 37 in one direction, alternately pulling the throwing arms 41 downwardly and placing the springs 46 under tension. When the throwing arm 41 of either machine has moved 30 to its lowest position, it is automatically latched in that position by the bolt 61 and remains so latched until the roller 58 of the lever 57 engages with the enlarged peripheral portion 53 of the cam, causing the bolt 61 to be moved out of the way of the arm 41 and releasing it to throw a ball.

45 As the arm nears the upper end of its flight, it is cushioned by the action of the piston 73 in the cylinder 74 so that it comes to rest without imposing undue strain on the mechanism. The valve 81 in the conduit 76 permits adjustment of the rate of back flow of oil from the cylinder 74 to the reservoir 75 and by adjusting the valve 81, the degree of resistance to 50 the upward movement of the arm 41 may be varied and thus vary the angle of delivery of the ball.

55 Balls alighting on the field 10 roll to the central lower portion thereof by gravity and are conveyed to the opening 13 in the net 11, thence along the trough 14 to the delivery table 21 where they are delivered equally to the two machines by gravity in a manner already described.

60 From the foregoing it will be apparent that we have devised a base ball throwing machine which is simple of design, sturdy of construction and automatic of operation. It will furthermore be apparent that we have devised 65 means in such a machine whereby relatively

heavy force is available for throwing the balls, which force may be so adjusted as to suit the individual needs of the batter. It will also be apparent that we have devised improved automatic means for operating machines of this character in tandem and when 70 so operated, the balls are returned to the machines and evenly distributed thereto.

75 While we have shown our invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications, without departing from the spirit thereof, and we desire therefore, that only such limitations shall be placed thereupon as are imposed by 80 the prior art, or as are specifically set forth in the appended claims.

What we claim is:

1. In a base ball throwing machine, a power driven shaft, a countershaft, a crank on the power driven shaft, crank means on the countershaft, a flexible member joining the crank to the crank means and adapted to effect rotation of the countershaft in one direction, a relatively heavy spring associated with 90 the countershaft and adapted to effect rotation thereof in a direction opposite to its rotation effected by the flexible member, and a throwing arm mounted on the countershaft.

2. In a base ball throwing machine, a power driven shaft, a countershaft, a crank on the power driven shaft, crank means on the countershaft, a flexible member joining the crank to the crank means and adapted to effect rotation of the countershaft in one direction, a relatively heavy spring associated with the countershaft and adapted to effect rotation thereof in a direction opposite to its rotation effected by the flexible member, a throwing arm mounted on the countershaft, 105 means for latching the throwing arm after rotation by the flexible member, and means for tripping the latching means when the flexible member is slack.

3. In a base ball throwing machine, a power driven shaft, a countershaft, a crank on the power driven shaft, crank means on the countershaft, a flexible member joining the crank to the crank means and adapted to effect rotation of the countershaft in one direction, a relatively heavy spring associated with the countershaft and adapted to effect rotation thereof in a direction opposite to its rotation effected by the flexible member, a throwing arm on the countershaft, means for 120 latching the throwing arm after rotation by the flexible member, means for tripping the latching means when the flexible member is slack, and means for cushioning the movement of the throwing arm when being actuated by the spring.

4. In a base ball throwing machine a continuously rotating power driven shaft, a crank on the shaft, a countershaft, a pair of pulleys on the countershaft, a flexible member posi- 130

- tively connected to the crank and to one of the pulleys and adapted to effect rotation of the pulley in one direction, a flexible member connected to and extending partway round the other pulley in a direction opposite to that of the first mentioned flexible member, a relatively heavy spring connected to the last mentioned flexible member and adapted to effect rotation of the countershaft in a direction opposite to the direction effected by the continuously rotating shaft, means for adjusting the initial tension of the spring, and a throwing arm secured to the countershaft.
5. In a base ball throwing machine, a countershaft, a throwing arm carried by the countershaft, a power driven shaft, a crank on the power driven shaft, flexible means connecting the crank and the countershaft and adapted to rotate the countershaft to pull the throwing arm to a downward ball receiving position and then slacken, resilient means associated with the countershaft and placed under tension when the throwing arm moves to its downward position, and cocking mechanism for holding the throwing arm in its downward position until the flexible means is slackened.
6. In a base ball throwing machine, a countershaft, a throwing arm carried by the countershaft, a power driven shaft, a crank on the power driven shaft, flexible means connecting the crank and the countershaft and adapted to rotate the countershaft to pull the throwing arm to a downward ball receiving position and then slacken, resilient means associated with the countershaft and placed under tension when the throwing arm moves to its downward position, cocking mechanism for holding the throwing arm in its downward position until the flexible means is slackened, gravity means for feeding base balls to the throwing arm, and tripping means operating in synchronism with the throwing arm and acting to deliver one ball at a time to the throwing arm.
7. In apparatus of the character described, an elevated field, a pair of base ball throwing machines located at one end of the field and below the level thereof, said field having sides sloping toward the center thereof whereby to collect balls alighting on the field by gravity, means for conveying the balls to the end of the field adjacent the machines, a trough for receiving the balls collected from the field, a tiltable distributing table positioned to receive balls from the trough and adapted to deliver balls to either side thereof, delivery chutes associated with the two sides of the table, and means operable by an excess weight of balls on either of the delivery chutes to tilt the table toward the other delivery chute.
8. The combination with a base ball throwing machine of the character described, of an obstruction having an opening through which the balls are thrown, a basket, means for normally positioning the basket to the rear of the opening to catch balls batted through the opening, and means for automatically pulling the basket out of the way of the throwing arm when a ball is being thrown.
- In testimony whereof we affix our signatures.
- PHILIP L. BIBLE.
JOE T. THRASHER.
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