July 26, 1966 C. D. JOHNS 3,262,439

BALL THROWING MACHINE

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Fig. 1

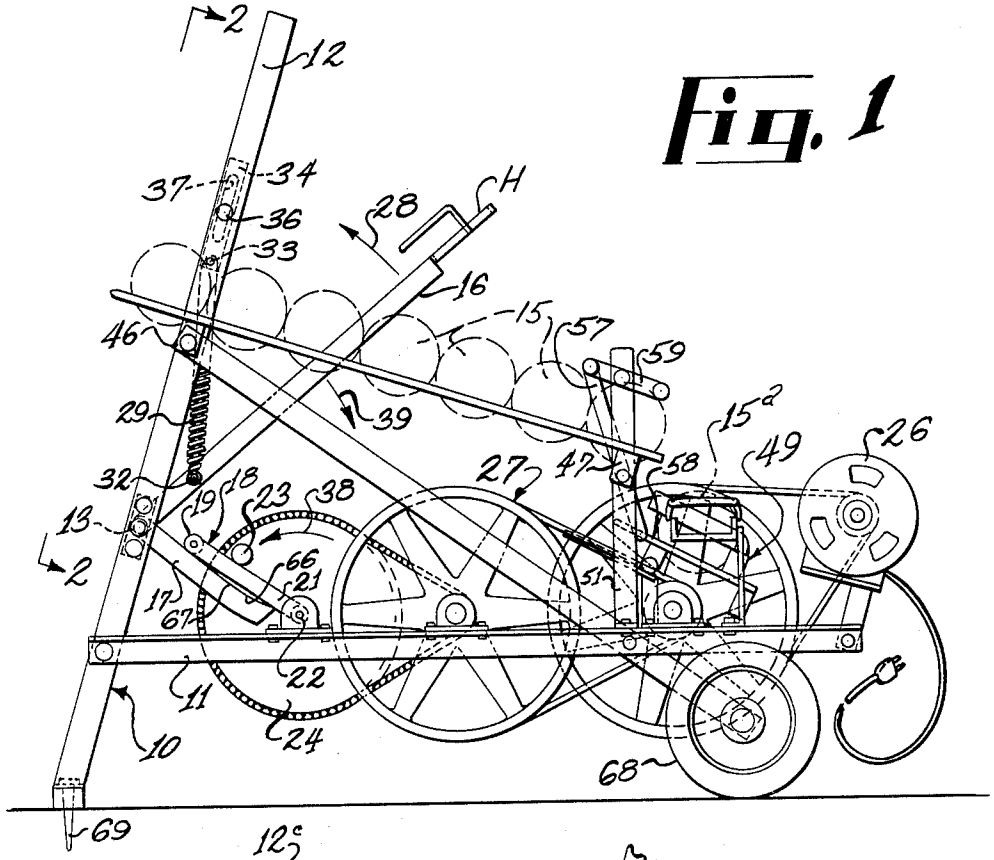


Fig. 2

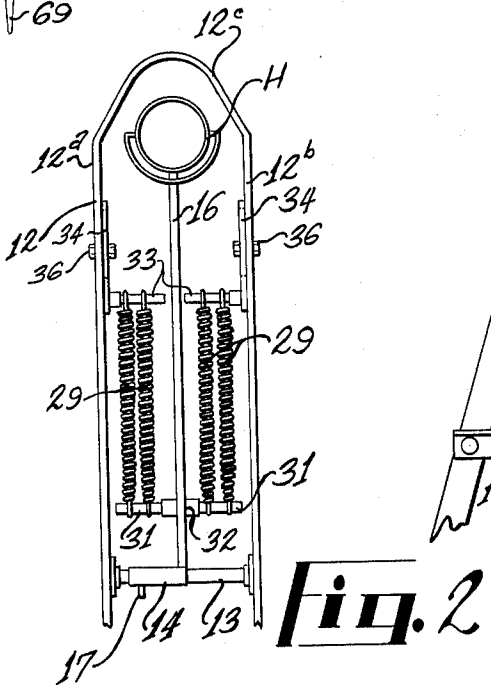
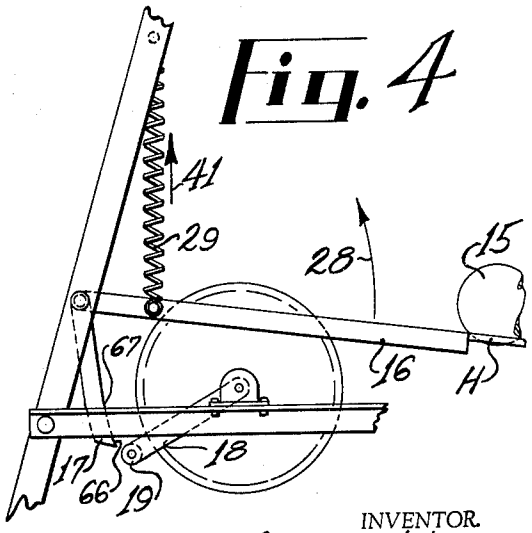


Fig. 4



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Fig. 3

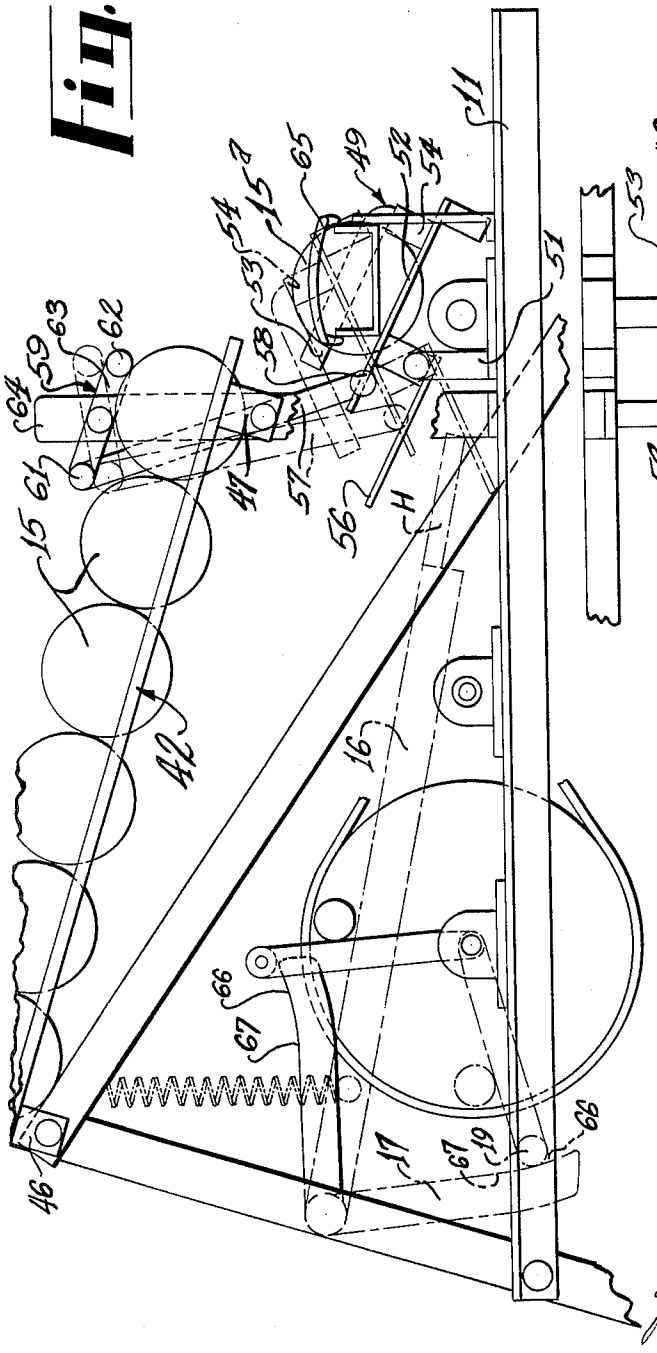
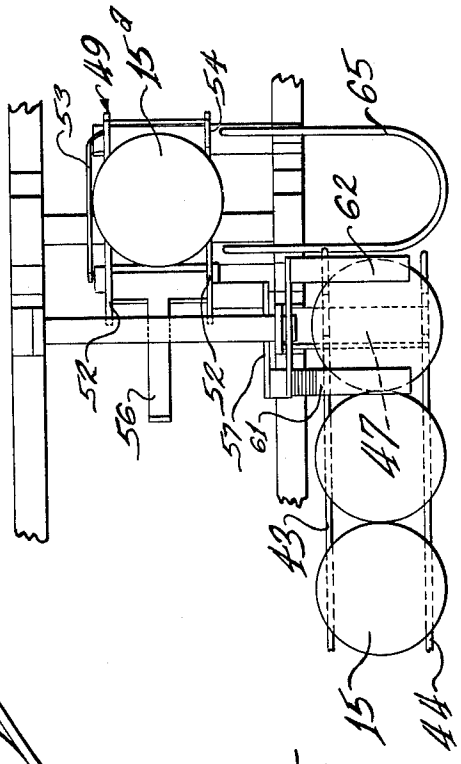


Fig. 5



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BALL THROWING MACHINE

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3 Claims. (Cl. 124—7)

This invention relates to a ball throwing machine and more particularly to a machine adapted to throw baseballs, particularly softballs, with the primary object that the trajectory of a ball thrown by the machine is substantially as required by the official rules of the game of softball.

Another object of this invention is to provide a baseball throwing machine adapted automatically and successively to throw a plurality of balls in a predetermined fashion and at regular, preselected timed intervals.

Still another object of this invention is to provide a ball throwing machine of the character designated having a relatively simple ball magazine and delivery system actuated by the throwing arm when it is cocked whereby a single ball is delivered at the proper time to the throwing arm.

A still further object of my invention is to provide a ball throwing machine of the character designated in which the force with which the ball is thrown is easily varied whereby the speed of the ball thrown may be controlled.

In the following description of the structure and operation of my invention reference is made to the accompanying drawings forming a part of this application and in which:

FIG. 1 is a side elevational view of the ball throwing machine showing the throwing arm as it is being cocked;

FIG. 2 is a fragmental front elevational view taken generally along line 2—2 of FIG. 1;

FIG. 3 is a fragmental side elevational view with certain parts omitted for the sake of clarity, showing in dashed lines the positions of the throwing arm and ball delivery mechanism at the fully cocked position;

FIG. 4 is a detail view showing the relationship of the throwing arm and follower arm and cam at the instant the throwing arm is released; and,

FIG. 5 is a fragmental plan view of the machine certain parts being omitted for the sake of clarity, showing the ball delivery mechanism and magazine in greater detail.

Referring now to FIG. 1 of the drawings, I show a frame indicated generally at **10** having a horizontal portion **11** and an upstanding portion **12**. As shown in FIG. 2 the upstanding portion **12** is in the shape of an inverted U having leg portions **12a** and **12b** and a base portion **12c**. A shaft **13** is secured between leg portions **12a** and **12b** at a point somewhat above the intersection of the horizontal portion **11** with the upstanding portion **12**. Mounted for rotation on shaft **13** is a sleeve **14** to which is rigidly attached an elongated arm member **16** and a cam follower member **17**.

A cam indicated generally by the numeral **18** is pivotally secured to the horizontal portion of the frame **11**. The cam **18** is in position to engage the cam follower arm **17** as the cam is rotated counterclockwise as viewed in FIG. 1 by the cam drive means to be described hereinafter. The cam comprises a roller **19** carried on the end of a cam arm **21** which is rotatably mounted as at **22** on the horizontal frame **11**. A driver stud **23** is carried by a sprocket wheel **24** and engages the arm **21**. The sprocket wheel **24** is operatively connected to the motor **26** by means of a chain and sprocket, belt and pulley arrangement indicated generally by the numeral **27**. This drive arrangement reduces the r.p.m. of the power supplied by the motor from approximately 1700 r.p.m. at the motor to 6 r.p.m. at the cam drive sprocket.

The throwing arm **16** is resiliently powered or urged in a counterclockwise direction, as indicated by the arrow **28** in FIG. 1 by means of a plurality of tension springs **29**. The lower ends of the springs **29** are secured to the throwing arm **16** by means of outwardly extending lugs **31** carried by the throwing arm **16** on opposite sides thereof at a point **32**, somewhat above the lowermost end of the throwing arm **16**. The upper ends of the springs **29** are secured to lugs **33** carried by sliding brackets **34**. The sliding brackets **34** are in turn adjustably secured to the frame **12** by means of bolts **36** passing through holes in the frame **12** and slots **37** in the brackets **34**.

In operation the motor **26** powers the drive mechanism **27** to turn drive sprocket **24** counterclockwise, as indicated by the arrow **38** in FIG. 1. The drive stud **23** carried by the sprocket **24** engages the cam arm **21**, thus pushing the cam roller **19** in a circular path about the axis **22**. The roller **19** engages the cam follower arm **17** and pushes the same downwardly and to the left as viewed in FIG. 1, thus pulling the throwing arm **16** downwardly in a clockwise direction as indicated by the arrow **39**. As the arm **16** is pulled downwardly the point **32** on the arm **16** moves away from the point **33** on the frame thus putting the springs **29** under tension. The roller **19** continues to move in a circular path pushing the arm **17** to the position shown in FIG. 4. When the roller **19** on the cam **18** passes the arm **17** the spring **29** pulls in the direction indicated by the arrow **41** in FIG. 4 and thus pulls the throwing arm **16** swiftly upwardly in a throwing motion, as indicated by the arrow **28**. As the arm **16** reaches approximately a vertical position the power in the springs **29** is exhausted and the arm stops but the ball continues to travel, thus being launched into its trajectory. The speed with which the arm **16** is pulled upwardly may be varied by adjusting the tension in the springs **29** by means of the above mentioned brackets **34**.

Turning now to the ball storage magazine and delivery mechanism, it is seen by referring to FIGS. 1, 3 and 5 that I provide a ball storage magazine indicated generally at **42** which comprises two parallel rails **43** and **44** which are horizontally spaced from each other and secured to the frame of the machine by means of brackets **46** and **47**. The rails **43** and **44** are inclined toward the rear of the machine, and are spaced apart so that they support balls **15** in a manner such that the balls move along the rails toward the rear of the machine, namely, to the right as viewed in FIGS. 1 and 3. A cradle assembly **49** is pivotally secured to upstanding members **51** which are in turn fixed to the horizontal frame **11**. The cradle comprises a pair of support rails **52**, a rear guide **53** and a block member **54**. A tongue **56** extends forwardly between the support rails **52** in position to be engaged by the throwing arm **16** as hereinafter described in greater detail. One end of a link member **57** is pivotally connected to the cradle as at **58**. The other end of the link member **57** is connected to a gating assembly **59** which comprises two horizontal outwardly projecting rods **61** and **62** carried by an arm **63**. Arm **63** is pivoted intermediate its ends to an upstanding member **64** on the frame **11**.

In operation a ball **15a** is placed in the cradle **49**. Balls are also in the magazine **42**, being held from moving downwardly because of the engagement of the rod **62** with the lowermost of the balls. The cam drive mechanism engages the cam with the follower arm **17** and pulls the throwing arm **16** downwardly as described above. As the arm **16** approaches its lowermost position its outermost extremity contacts the tongue **56** thus causing the cradle to rotate in a counterclockwise direction, as shown

in FIG. 3, until the arm **16** and the cradle **49** assume the position shown in dotted lines. In this position the ball **15a** rolls into the hand portion H of the throwing arm **16**. As the cradle rotates to the dotted line position it pulls the link **57** downwardly which in turn rotates the arm **53** about its pivot point thus raising the rod **62** and lowering the rod **61**. When the rod **62** is raised the lowermost ball in the magazine is allowed to drop free of the magazine into a cross-race **65** where it rolls toward the cradle until it strikes the member **54** and is retained until the cradle resumes its original position, whereupon the ball in the cross-race rolls into the cradle. The rod **61** in the meantime restrains the other balls in the magazine from moving.

I provide for a dwell or pause between the time the throwing arm **16** reaches its fully cocked position and the time that it is released by providing a curved portion **66** at the end of the cam follower arm **17** having the same radius as the radius of rotation of the cam. That is to say, when the cam roller **19** reaches the point **67** on the follower arm **17** the arm **16** has reached its lowermost position. Since the curve from the point **67** to the end of the arm **17** is of the same radius as the radius of rotation of the cam, the arm **16** does not move until the cam moves past the end of the follower arm as shown in FIG. 4. This dwell time allows the ball to be delivered to the throwing arm and come to rest so that the system is stable when the throwing motion commences.

From the foregoing it is seen that I have devised a new and improved ball throwing machine in which balls are tossed or thrown with a predetermined force at regular, timed intervals. I provide a magazine and delivery system which automatically positions a ball in the hand portion of the throwing arm for each throw. By providing a power train which reduces the speed of rotation from the motor to the cocking mechanism I am able to use a relatively small motor to operate a powerful, positively acting machine. The cam **18** rotates separately from the drive sprocket to prevent undue strain from being applied to the drive mechanism at the instant the follower arm is released. By providing a pair of ground engaging wheels **68** at the rear of the machine I make the machine portable, as the member **12c** can be used as a handle whereby the machine is lifted and moved. A removable spike **69** may be provided at the lowermost part of the upstanding frame **12** whereby the machine may be anchored to the ground when in use. The machine is durable, positive in action and relatively simple to manufacture.

While I have shown my 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 I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In a ball throwing machine including a frame, a throwing arm pivotally mounted on said frame for motion

in a vertical plane between substantially horizontal cocked position and a substantially vertical discharge position, resilient means to move said arm upwardly in throwing motion toward the discharge position, and means to move the arm downwardly to the cocked position, the improvement which comprises:

(a) means to support a row of balls for movement in one direction,

(b) a vertical member secured to said frame adjacent the end of said support means toward which said balls move,

(c) a cross member the length of which is substantially the same as the diameter of one of said balls pivotally secured to said vertical member substantially parallel to said support means,

(d) first and second stop members secured to the ends of said cross member and extending above and across said support means a distance substantially the same as the diameter of one of said balls, said first stop member being secured to the end of said cross member nearest the above mentioned end of said support means, said second stop member being secured to the other end of said cross member,

(e) means to tilt said cross member whereby said first stop member contacts and retains a ball on said support means until the throwing arm reaches its cocked position whereupon said first stop member releases said ball while said second stop member retains another ball, and

(f) means to deliver the ball released by said first stop member to the throwing arm.

2. A ball throwing machine as defined in claim **1** in which said means to deliver the ball released by said first stop member to the throwing arm comprises:

(a) a ball cradle pivotally secured to the frame in position to receive a ball released by said first stop member,

(b) a forwardly extending tongue member on said ball cradle in position to be contacted by the throwing arm as it comes into cocked position, and

(c) said ball cradle being pivoted forwardly of its center of gravity whereby it remains in ball retaining position until the throwing arm contacts said tongue member to pivot the ball cradle to a ball delivery position.

3. A ball throwing machine as defined in claim **2** in which said means to tilt said cross member comprises a link member pivotally secured to said ball cradle and said cross member.

References Cited by the Examiner

UNITED STATES PATENTS

783,523	2/1905	Hoffman	124—7
2,815,743	12/1957	Bruderman	124—7
2,877,757	3/1959	Giovagnoli	124—7

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