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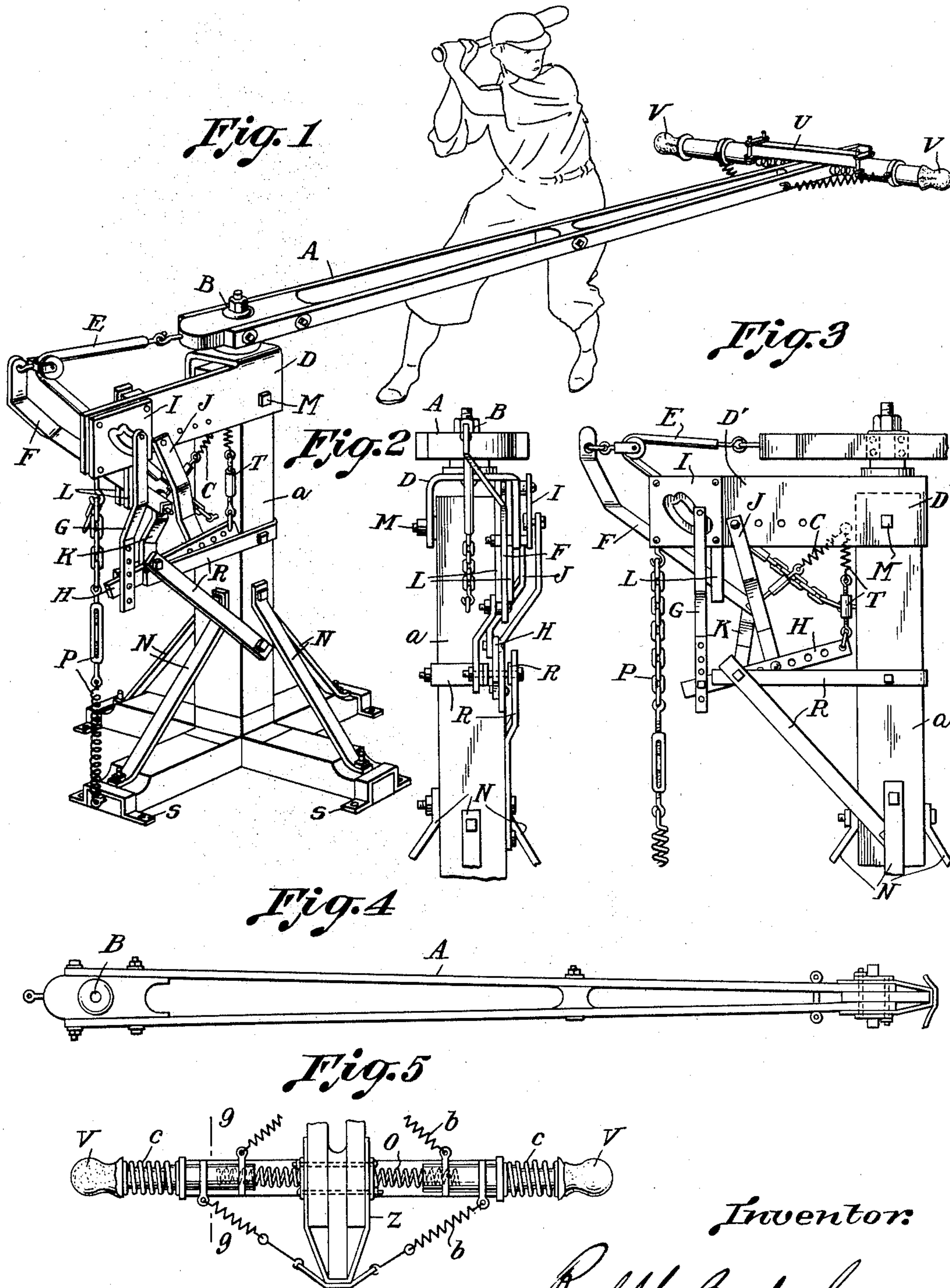
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BASEBALL BATTING PRACTICE MACHINE

Filed May 19, 1932

2 Sheets-Sheet 1



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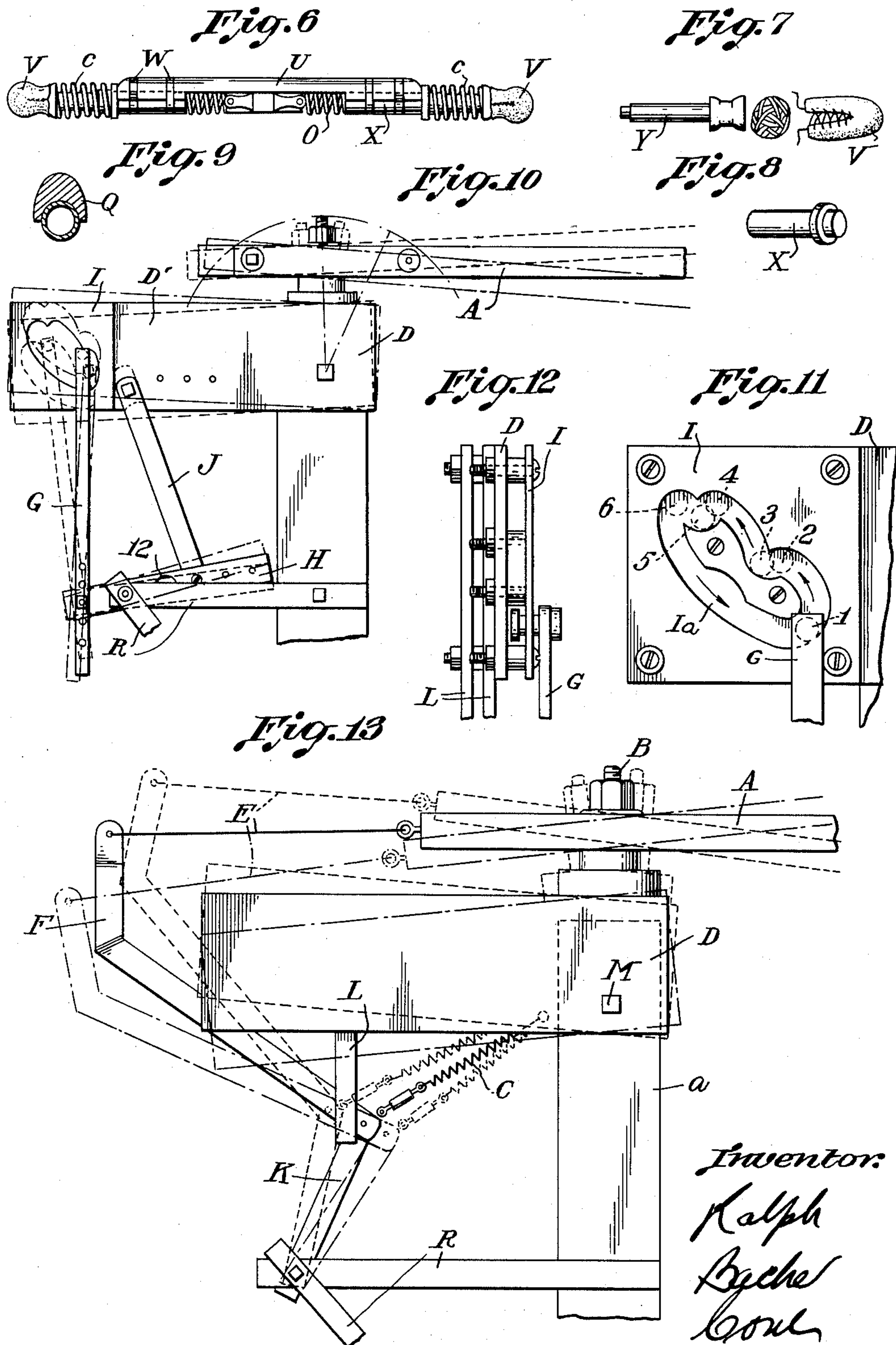
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## UNITED STATES PATENT OFFICE

1,962,087

## BASEBALL BATTING PRACTICE MACHINE

Ralph Bache Cone, Long Island City, N. Y.

Application May 19, 1932, Serial No. 612,306

11 Claims. (Cl. 273—26)

This invention relates to a batting practice machine, by means of which the services of a pitcher and fielders are dispensed with, the usual functions of the pitcher and fielders being performed entirely by mechanical devices.

It is the primary object, therefore, of my invention to provide a machine of the simplest possible character compatible with the requirements above outlined, by which a batter may properly develop and increase his batting skill.

A further object of the invention is the provision of a novel mechanism which is useful as a general exercising machine.

Further objects and advantages of the invention reside in the various combinations hereafter described and claimed, as will be better understood by reference to the following specification, when read in connection with the accompanying drawings illustrating the preferred embodiment, thereof, in which,

Figure 1 is a perspective view of the complete machine in operation.

Figure 2 is a rear elevation of the operating mechanism, omitting the assembly P P.

Figure 3 is a side elevation of the operating mechanism, omitting the assembly P P.

Figure 4 is a plan view of the construction of the arm, designated A in Figures 1, 2 and 3.

Figure 5 is a plan view of the cross member.

Figure 6 is a side elevation of the cross member.

Figure 7 is an exploded elevation of the cross member plungers disclosing the manner of attaching the balls to said plungers.

Figure 8 is a perspective view of the aluminum tubes.

Figure 9 is a cross-sectional view taken in Figure 6 along the line 9—9.

Figure 10 is an enlarged view of Figure 3 showing how the pitch of the arm is controlled, and how the machine may be adjusted to different degrees of pitch.

Figure 11 shows an elevation of the eccentric runway.

Figure 12 shows an end view of the eccentric runway shown in Figure 11.

Figure 13 shows an enlarged view of Figure 3 disclosing the section of the equalizer in maintaining a certain degree of speed to the ball as it is presented to the batsman.

The batter, standing at the front of the machine, as in Figure 1, hits one of the balls, V, carried at either end of the cross member U at the free end of the arm A.

Impelled by the force of the blow, which is delivered by the batter from left to right in the

direction of the plane of the paper or drawing in Figure 1, the arm swings pivotally on the bearing B, to the right in Figure 1, away from the batter in a plane approximately perpendicular to the pivot bearing B. The arm A and ball V are restored to their initial or hitting position by the elastic action of the rubber cord of E.

If the ball V is struck a sufficiently powerful blow, the arm A, rotating about an axis perpendicular to, and in the center of the upper surface of the cap-piece D, passes a certain point of balance, and the cap-piece D, with the arm A and the cross member V, tilt backward on the bolt M, which secures said cap D to the upright post a. It will be observed that the plane in which the arm A rotates remains always parallel to the upper surface of the cap-piece D.

The amount of this tilting motion, caused by the shifting weight of the arm A and the cross member U, is controlled by the action of a roller-rod G. Said rod has a roller G' which engages in the notches of the eccentric slot I' which is formed in the plate I, bolted to the arm D', an extension of the cap D, thus securing said rod G in position as the elastic cord E delivers the ball V to the batter.

There are three positions, most plainly seen in Figure 11, which are numbered 2, 4, and 6 along the eccentric slot I', in which the roller G' engages, resulting in three changes of pitch, each a few inches higher than its predecessor. The slot I' has a "drop" portion Id, in which the roller G' moves when said roller returns from its highest relative position to its lowest position. These three notches and the "drop" portion in the slot I' permit the delivery of four different types of simulated pitches. These deliveries may be hit by the batter in rotation, or the delivery controlled by the "drop" portion Id, of the slot I', may be repeated in a manner to be explained later, and practiced upon to the exclusion of the other forms of delivery.

The point of balance, or the spot in the arc of movement described by the cross member U, at which the moving weight causes the cap D to tip backward, may be placed at the will of the batter anywhere on said arc described about the pivot bearing B within a range of 180 degrees. For by putting tension on the spring F, which acts as a counter-weight, said point of balance may be advanced to the point of contact with the bat. Similarly, by putting on the spring T, the point of balance may be moved in the opposed direction away from the batter. This spring T, attached at one end to the cap D, performs this



function through the medium of the member H hingedly attached to its free end and the link J. The member H is pivoted at its opposite end to the rigid support R. The bar works on a collar, 5 slightly thicker than itself. Two fulcrums, one of which is visible in the drawings and referenced 12', are provided for variety of adjustment. Said member H has a series of pivot holes spread along its length between the pivot point H' and the 10 point of connection of the spring T. The cap D has a rearwardly projecting arm D' which has a series of spaced pivot holes. The cap D and the member H are connected together by means of a link J which has pivot bolts in both ends which 15 are adapted to pass through any one of the holes in the arm D' or in the member H. By this arrangement of a linkage a force upward on the arm D' is produced by tensioning the spring T.

Thus, by manipulating the springs P and T, 20 the point of balance may be shifted at the will of the performer. This feature is a factor in the great versatility of the machine, as every change in the point of balance means a change of speed, a change in the time of the delivery, and 25 a change in the amount of power required to operate the mechanism. By releasing the spring 8 and increasing the tension on the spring T, a point will be reached where the delivery will repeat. Thus all deliveries except the "drops" may 30 be isolated.

The arm A, shown in detail in Figure 4, is a built up structural member giving a maximum of strength with a minimum of weight.

The cross member or batting assembly shown 35 in detail in Figures 5, 6, 7, 8 and 9, has a bar or cross piece U which is slidably mounted upon the end of the arm A for sliding and rotational movement in any direction in a plane parallel to the top surface of the arm A. Said cross-piece U also 40 has a limited rotational movement about the arm A as an axle. This universal movement of the cross member U is controlled by the springs b and O which connect the cross member to the arm A as shown in Figures 5 and 6. The cross member 45 U has a tube X mounted on each end which serves as a bearing or bushing for the plunger Y. Said tube X, which is shown in detail in Figure 8, has a flange or collar welded on its external periphery. Said collar acts as a seat for the large spring c. 50 The springs O and c absorb the force of the blows impinged upon the ball V by the batter. A casting on the plunger Y holds the ball V in place. Said ball is covered with a wear-resisting cover which is preferably made of leather.

The action of the roller rod G, in combination 55 with the bars J and H, in controlling the pitch of the arm A is shown in Figure 10. The roller rod G is pivotally connected at its end opposite to the roll G', to the bar H by means of a pivot bolt 60 adapted to fit in any one of a series of pivot holes joined in said rod G. By this arrangement the roller rod G rises as the eccentric slot I' descends, and sinks as the eccentric slot I' rises. The amount of this movement of the roller rod may 65 be decreased or increased by moving either end of the link J toward or away from the post a by means of the pivot holes provided in the member H and the arm D'. At the same time, the tilt of the cap D, and of course the angle of divergence 70 between the simulated delivery of high and low balls—which is also the measure of the "drop"—is increased by the same means. Solid, broken and dotted lines show the members A, I, D, J, H and G in the eccentric slot I'.

75 In the position indicated by the solid lines the

delivery of this machine approximates a pitcher's side arm fast ball.

In the position indicated by the dotted lines the delivery approximates an underhand fast ball, as it slowly rises as it approaches the batter. 80

In the position indicated by the broken lines the delivery approximates an overhand fast ball, as it slowly descends as it approaches the batter.

These deliveries are called "fast" balls, because, although slow moving, they give the effect of speed—a feature that will be explained later—and 85 because of their flat trajectories,—in contradistinction to the familiar parabolic trajectory of the slow ball.

Owing to the construction of this machine, the 90 ball approaches the batter on an arc of which the distance from the ball to the bearing is the radius, but this in no way detracts from its value as a batting practice machine, as it only makes the operation of hitting the ball more difficult, and 95 makes the practice, therefore, more valuable. Disregarding this curvature, we see that all balls except the "drop" approach the batter with the trajectory of a bullet. This makes the machine especially valuable in preparation for the fast 100 balls of a real pitcher.

Figures 11 and 12 are rear and side elevations, respectively, of the eccentric slot, showing the six different positions occupied by the roller in making the circuit thereof. 105

Suppose the roller in position 1—the adjustments being identical with those in Figure 10. The position of the cap and arm will coincide with that of the broken lines in Figure 10. A sharp blow sends the arm and cross member across the 110 point of balance, the cap tilts, and the roller, rising to meet the descending slot, engages in the notch at position 2. The moving arm, now being restored to its original position before the batter, crosses the point of balance a second time, and 115 the cap, tilting forward, is securely held in the notch at position 3.

The player hits the ball again, and the arm again crosses the point of balance. The roller is caught in position 4, and as the arm swings forward to the batter, it passes the point of balance, 120 the roller secures the delivery at position 5, which, in Figure 10, would be a rising ball, represented by the dotted lines.

The ball is struck again presumably in the exact center, and as the arm, propelled by the blow, passes the point of balance and tilts the cap backward, the roller is engaged at position 6. Here it remains until the arm, returning the ball to the 125 batsman, passes the point of balance, and, having no support, drops rapidly as it approaches the batter, the roller moving along the line Id. This descent is arrested as the roller returns to position 1. This is the "drop" and the severity of the descent may be controlled by manipulation of the 130 spring P.

These changes of pitch are only relative. They are overhand, side-arm, or underhand balls only when the controlling members are set in a certain position. By taking advantage of holes in the 135 connecting rod all deliveries may be descending ones, or all rising ones of different pitch. Or it may be so adjusted that the lowest offering may be a side-arm ball and the other two rising balls of different pitch. Again, the highest ball may 140 be the side-arm delivery and the others descending balls of different pitch.

Two hundred and forty adjustments may be made, with 4 deliveries to each adjustment—a total of 960, 720 of which are changes of pitch, 145



the remaining 240 being "drops" of varying heights. Add to these the changes of speed to be obtained and it will be seen that the number of offerings delivered by this machine are truly infinite.

It is obvious that more power is required to present an ascending ball to a batter than one that pursues a downhill course. If the power applied by the elastic cord to the rear end of the circulating arm were at all times constant, some deliveries would be too slow, and others would be unhittable.

Figure 13 shows the combination of the parts F and K which increases and relaxes the tension on the elastic cord E as more or less power is required. As the action of the elastic cord on the parts F and K presses the cap D away from the rigid structure R,—preventing the cap D tilting at the point of balance—a spring C is employed to neutralize this force.

While this spring performs its function in a satisfactory manner, it by no means equalizes the pace of deliveries. A feature of this machine is that there is a change of pace with each delivery.

L L are guides for F.

Although the ball moves slowly to the batter at all times it has the effect of speed. For the position and speed of the ball can hardly be estimated when it occupies a position 90, or even 45 degrees from the batsman. It is only when the ball comes almost directly at the hitter that he can estimate its position and aim his blow with certainty; and as the time occupied by the ball in traversing this short distance is practically the same as that consumed by a fast ball in negotiating the 60 feet that separate the box and the home plate, we have the effect of speed although no great speed is present. The batter has the same time in which to set himself and aim his blow as on the playing field, with the added constructive feature of hitting at a ball that approaches him with the trajectory of a bullet.

On the playing field it is necessary to strike the ball squarely. The demands for accurate hitting imposed by this machine are no less exacting. Unless the ball on this machine is hit in the exact mathematical center the machine refuses to function correctly or in proper rotation. When the ball is hit too lightly the arm fails to pass the point of balance and the delivery repeats. Certain improper blows cause the roller to skip a notch—sometimes two.

These facts bring out another feature of this machine—that it is as difficult to foretell deliveries as it is to outguess a real pitcher on the playing field.

Another feature of this machine is that by its use more practice may be obtained than in a whole season on the playing field.

The difference between this machine and others built for general exercise lies in the fact that this machine is infinitely more difficult to operate. On all other machines invented for this purpose, one soon reaches the point where he can operate the machine and think of something else at the same time. When this point is reached the benefits to be derived from such exercise are doubtful, and certainly the educational value of the machine has vanished. In practice on this machine this point is never reached. It never relaxes its demands on the power to concentrate and to coordinate the mental and physical faculties. One can never become a perfect performer on this machine, but the more one practices the more skillful one becomes.

Various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention, or sacrificing any of its material advantages, the form hereinbefore described being merely preferred embodiments thereof.

I claim:

1. A batting practice machine consisting of an upright post suitably supported, an arm that swings pivotally in horizontal and near horizontal planes about the top of said post, a cross member bearing balls at each end, perpendicularly disposed at the free end of said arm, means of returning said balls, when struck, to the batsman, automatically effecting, at the same time, a change in the delivery.

2. In a batting-practice machine the combination of an arm swinging pivotally in horizontal or near-horizontal planes on a tilting axis, said axis being secured perpendicularly to the upper surface of a cap-piece surmounting an upright post, the tilt of said arm, axis and cap being automatically controlled by the action of a roller within the confines of an eccentric runway.

3. A batting practice machine consisting of a support, a cap pivotally mounted upon said support for swinging movement in a vertical plane, an arm pivotally mounted upon said cap for swinging movement in a plane at approximately right angles to the plane of movement of said cap, a ball secured to the free end of said arm, means for returning said arm to its approximate initial position after it has been displaced from said position by striking said ball.

4. A batting practice machine consisting of a support, an arm pivotally mounted on said support for swinging movement in both an approximately horizontal plane and a vertical plane, a ball secured to the free end of said arm, means for returning said arm to its initial position after it has been displaced from said position by striking said ball, means for controlling the path of movement of said arm as it returns to its approximate initial position.

5. A batting practice machine consisting of a support, a cap pivotally mounted upon said support for swinging movement in a vertical plane, an arm pivotally mounted upon said cap for swinging movement in a plane at approximately right angles to the plane of movement of said cap, a ball secured to the free end of said arm, means for returning said arm to its approximate initial position after it has been displaced from said position by striking said ball, means for varying the angular position of the cap about its pivot point relative to said support.

6. A batting practice machine consisting of a support, a cap pivotally mounted on said support for swinging movement in a vertical plane, an arm, mounted on said cap for swinging movement in an approximately horizontal plane, a ball secured to the free end of said arm, means for returning said arm to its initial position after it has been displaced from said position by striking said ball, means connecting said support and said cap for controlling the path of movement described by said arm as it returns to its approximate initial position.

7. A batting practice machine consisting of a support, a cap pivotally mounted upon said support for swinging movement in a vertical plane, an arm, pivotally mounted upon said cap, for swinging movement in a plane at approximately right angles to the plane of movement of said cap, a ball secured to the free end of said arm,



means for returning said arm to its initial position after it has been displaced from said position by striking said ball, cam controlled means connecting said cap and said support for controlling the path of movement described by said arm and said ball as they return to their approximate initial position.

8. A batting practice machine, consisting of a support, a cap pivotally mounted upon said support for swinging movement in a vertical plane, an arm pivotally mounted upon said cap for swinging movement in a plane at approximately right angles to the plane of movement of said cap, a ball secured to the free end of said arm, means for returning said arm to its approximate initial position after it has been displaced from said position by striking said ball, adjustable spring means for varying the angular position of the cap about its pivot point relative to said support.

9. A batting practice machine consisting of a support, a cap pivotally mounted upon said support for swinging movement in a vertical plane, an arm pivotally mounted upon said cap for swinging movement in a plane at approximately right angles to the plane of movement of said cap, a ball secured to the free end of said arm, means for returning said arm to its approximate initial position after it has been displaced from said position by striking said ball, adjustable means for varying the angular position of the cap

about the pivot point relative to said support, and means connecting said cap and said support for controlling the path of movement described by said arm and said ball as they return to their initial position.

10. A batting practice machine consisting of a support, a cap pivotally mounted upon said support for swinging movement in a vertical plane, an arm pivotally mounted upon said cap for swinging movement in a plane at approximately right angles to the plane of movement of said cap, a ball resiliently secured to the free end of said arm, means for returning said arm to its approximate initial position after it has been displaced from said position by striking said ball, adjustable means for varying the angular position of the cap about its pivot point relative to said support, and cam controlling means connecting said cap and said support for controlling the path of movement described by said arm as it returns to its initial position.

11. A batting practice machine consisting of an upright member suitably supported, an arm that swings pivotally in approximately horizontal planes about the top of said upright, a cross-member bearing a ball at each end, perpendicularly and horizontally disposed at the free end of said arm, means for returning said balls to the batsman when struck, and means for automatically effecting a change of delivery.

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