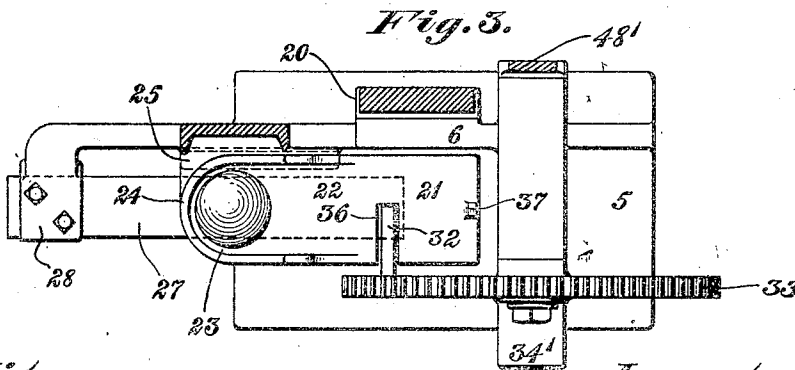
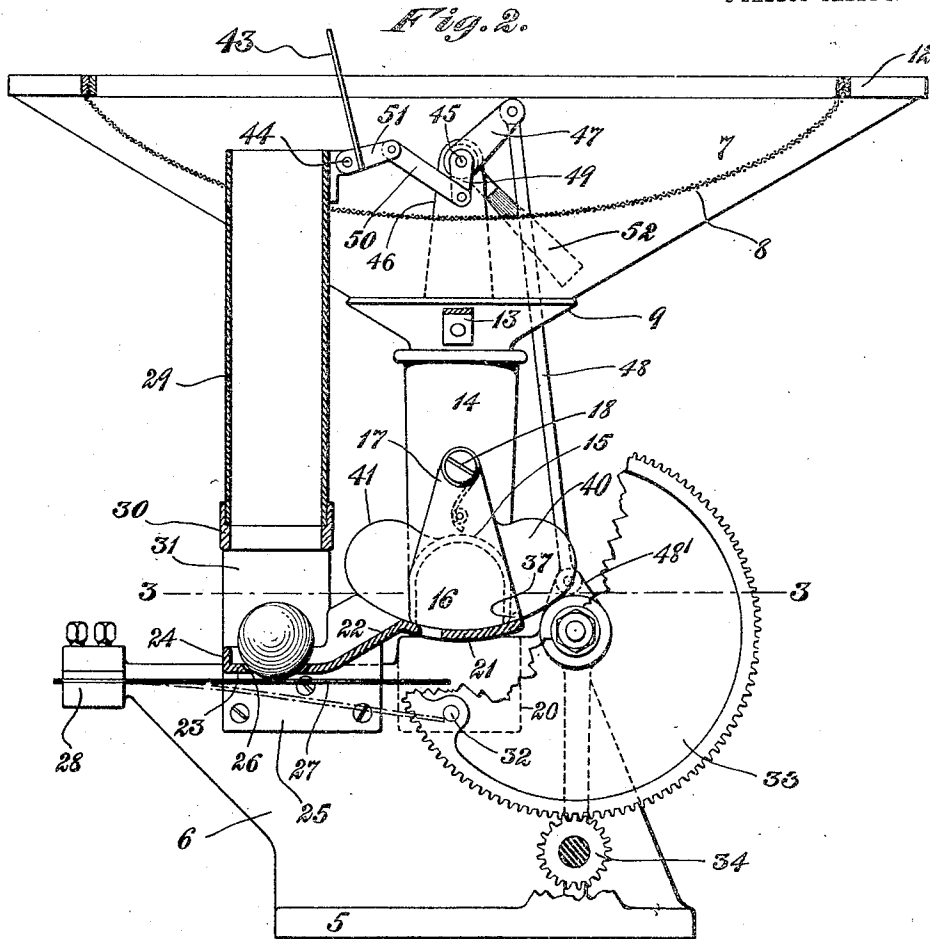


I. L. REEVES.
 TARGET PROJECTING MACHINE.
 APPLICATION FILED APR. 15, 1912.

1,047,989.

Patented Dec. 24, 1912.

2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

IRA L. REEVES, OF NATICK, MASSACHUSETTS.

TARGET-PROJECTING MACHINE.

1,047,989.

Specification of Letters Patent.

Patented Dec. 24, 1912.

Application filed April 15, 1912. Serial No. 690,689.

To all whom it may concern:

Be it known that I, IRA L. REEVES, a citizen of the United States, residing at Natick, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Target-Projecting Machines, of which the following is a specification.

This invention relates to target projecting.

In the drawings accompanying and forming part of the present specification, I have represented in detail one of the several convenient forms of embodiment of the invention, which to enable those skilled in the art to practise the same will be set forth fully in the following description, while the novelty of the invention will be included in the claims succeeding said description. From this it will be clear that I do not limit myself to such showing; I may depart therefrom in several respects within the scope of the invention included in said claims.

Referring to said drawings: Figure 1 is an end elevation partly in section of a target involving my invention. Fig. 2 is a front elevation partly in section of the same. Fig. 3 is a horizontal section on the line 3—3 of Fig. 2. Fig. 4 is a detail view in sectional elevation hereinafter more particularly described.

Like characters refer to like parts throughout the several figures of the drawings.

The different parts of the apparatus may be supported in any desirable manner such as by the framework shown, which comprises the base 5 and the standard or column 6 rising therefrom. The base may rest upon any suitable foundation.

As will hereinafter appear the machine involves in its operation one or more movable objects or target members, and such an object or target member may be of any suitable character, consisting preferably but not necessarily, of a ball or sphere which may be made from celluloid, composition, glass or any other convenient material, and as a matter of preference I provide several of such objects or target members. When the apparatus is in action, these objects or target members are caused to travel in a circuit and during part of this travel are in the line of

vision of a marksman, at which time it is the object of the marksman to strike with a missile, the said object.

The apparatus preferably involves a container for the target members, and this container may be of any suitable nature, for instance it may as shown consist of a hopper 7, which may be constructed in any desirable manner, although the body 8 thereof is ordinarily of some suitable fabric such as textile material, in view of which noise is practically eliminated. The lower edge portion of the body 8 is clamped between the plates or flanges 9 and 10, the latter having a depending tubular portion 11 which constitutes the outlet for the hopper and through which the balls or equivalents can successively pass. In the construction shown the upper edge of the substantially conical fabric body 8 is clamped between the hoops 12 and between said hoops and the lower flange or plate 9 braces as 13 extend to thus hold the fabric body 8 in desired shape. The tubular member 11 is fitted for example by screwthreading, in the bent or curved pipe 14 which with the tube constitutes a duct or runway for the balls after they leave the hopper or equivalent container 7. At the delivery end of the pipe 14 is operative a target-member-forwarding device 15 which as represented, is practically in the form of an arch or inverted U. Normally the open inner side of this arch-like forwarding member 15 is in register or coincidence with the outlet or discharge orifice of the pipe 14, so that when a ball leaves the said pipe it will enter said forwarding member and be advanced thereby on the movement thereof. The outer side of the said forwarding member 15 is closed by the wall 16.

The forwarding member 15 is shown provided at its ends with upwardly extending complementary arms 17 fixed to the rock shaft 18 supported by a bearing 19 on the side of the pipe 14 which has a web or flange extending to the base 20 and which is attached by screws or otherwise, to the column 6. From this it will be evident that the forwarding member 15 is oscillatory in character, although this is not essential. This oscillatory forwarding member 15 coacts with the rest or shelf 21, the upper side of which is on a curve concentric with the axis of

motion of the forwarding member 15 and normally the said forwarding member overlies the said rest or shelf 21 as shown in Fig. 2, so that the ball after it leaves the tube or pipe 14 will pass onto said rest or shelf 21 and will be confined for the time being, in the forwarding member 15. Extending downward from the rest 21 is the inclined way 22 which leads to the seat 23 having at its outer side a stop 24 consisting of a flange or lip. In the construction shown the three parts 21, 22 and 23 are made in one, and the integral part is provided with a depending flange 25 fastened by screws or otherwise to the column 6. The ball support 23 has an opening 26 to temporarily receive the ball, the diameter of this opening being very much less than the maximum diameter of the ball, so that the ball cannot pass through said opening. This opening also provides for the proper positioning of the ball for action by an impelling or equivalent member which device on its action is adapted to forcibly elevate or otherwise move the ball into the line of vision of the shooter. The impelling or equivalent device may be of any suitable nature. As shown it consists of an elongated spring 27 longitudinally adjustably secured at its butt between the sections of the clamping device 28 on the column or upright 6, the free portion of the spring being adapted to operate against a ball while it is in the opening 26 so as to impart an accelerated upward movement thereto, and in the present case to project them above the hopper 8 and into the line of vision of the marksman. It will be assumed that a ball has passed from the pipe 14 into the forwarding member 15 and onto the shelf or support 20 and that said forwarding device has been operated from its normal position shown in Fig. 2 to its shifted position shown in Fig. 4. On the motion of said forwarding device the ball is carried therewith, and as soon as it strikes the inclined way 22 it travels down said way and passes into the opening 26 where it can be operated by the projecting or impelling member 27. The projecting or impelling member 27 is shown by full and dotted lines in its two positions in Fig. 2. When the spring 27 is released and flies upward the ball will be projected thereby into the tube 29, the axis of which is coincident with the axis of the opening 26. This tube 29 is situated a short distance above the ball support 23 and fitted around its lower end is a band or ring 30 formed at the end of a shank 31 extending from the flange or plate 25. The upper portion of the tube 29 extends through the body 8 of the hopper. The power of the projecting or impelling member 27 will force the balls entirely through the guide duct or tube 29 and above the hopper 7, and it should be the aim of

the marksman to hit the balls while they are above the hopper. The unhit balls will fall into the hopper and will then pass from the same into the pipe 14 in the manner already indicated, so that said balls are practically caused to follow a circuit, means being provided as will hereinafter appear to positively prevent the balls entering the tube 29 as they fall into the hopper 7.

Means are provided for retracting or drawing back the spring 27, and although this means may vary as to character, the pin 32 answers satisfactorily in this connection, said pin being rigidly connected with and extending laterally from the face of the wheel 33 which may as illustrated be of toothed type and be driven by the pinion 34, the shafts for said wheels being supported respectively by the column 6 and a bearing 34' rising from the base 5. The shaft for the pinion 34 rigidly carries the wheel 35 which may be operated in any desirable manner, for instance by a band placed about the same but not shown. On the rotation therefore of the wheel 35 the spur gear 33 will be operated to revolve the spring operating pin 22, the free end of the spring 27 being in the path of said pin 32 and the shelf or support 21 being notched as at 36 to provide for the passage of said pin. As the wheel 33 rotates the pin 32 at the proper point will engage the free end of the spring 27 and will draw said spring downward from the full line position in Fig. 2 to the dotted line position in said view, and when said pin passes free of said spring the latter will be released so that it can fly upward at a very rapid rate of speed and thereby strike the ball resting thereabove with sufficient force to shoot said ball upward, entirely through the tube 29 and above the hopper 7. The spring 27 is longitudinally adjustable as will be understood by reason of which the stroke thereof can be readily regulated.

The ball forwarding member 15 is normally held in its retracted position against a suitable stop such as 37 in some suitable way as by the spring 38 coiled about the shaft 18 and the free portions of which bear against studs 39 on the inner sides of the two supporting arms 17. Said forwarding member 15 is shown provided on its outer side with a wing 40 constituting a suitable valve member and which on the working or advancing movement of said ball-forwarding member closes the mouth or delivery end of the tube 14 and thereby prevents the escape of the balls therefrom at such time. The pipe is provided with a lateral wing 41 near its discharge end, and which is practically swept by the open side of said ball forwarding device to thereby prevent the lateral movement of the balls when said forwarding device is in its advanced relation,

it being remembered that the opposite or outer side of the said ball forwarding member is closed by the wall 16.

To operate the ball forwarding member 15 any suitable means may be provided. For this purpose I have shown the pin 32 already described which answers satisfactorily, said pin on the rotation of the said gear being adapted to ride along the outer side face of the forwarding member supporting arm 17 to thereby swing the ball forwarding member 15 from ball receiving to ball shifting position, and when said operating pin 32 has passed out of engagement with the cooperating arm 17 the said forwarding member 15 is returned to its initial position by the spring 38. After said pin 32 has shifted and then released the forwarding member 15 to cause the positioning of a ball, it will shift and then release the spring 27 so that the latter can project said ball upward in the manner already set forth.

The discharge end of the tube 29 is controlled by a valve or equivalent member, and the flap 43 answers satisfactorily in this connection, said valve being fastened to the rock shaft 44 sustained by a suitable bearing near the upper open end of the tube 29. Associated with the shaft 44 is a second rock shaft 45, supported by bearings as 46 rising from the annular plate 10 to which I have already referred. Fastened to the shaft 45 is a rock arm 47 to which the link 48 is pivoted, said link being likewise connected to a crank arm 48' fastened to the shaft of the spur gear 33. The shaft 45 is provided with a rock arm 49 connected by the link 50 with the crank arm 51 on the shaft 44, and the parts are so related that just after a ball has been projected from the tube 29, the flap 43 will be swung down to close the upper end of said tube and thereby prevent said ball reentering the same from above as the same falls, it being the intention that the ball should pass directly into the hopper 8. After the valve is moved to closed position, it will, of course, be again opened by the mechanism described. It is not essential of course to employ a valve of the character noted for the purpose mentioned nor is it necessary that the valve be operated by mechanism such as that described and the same observation in fact applies to the other parts herein described.

Attached to the shaft 45 is a brush 52 which oscillates as the shaft 45 rocks, over the discharge opening of the hopper 7 and which by its action prevents the balls from clogging or choking said discharge opening and naturally therefore insures said balls leaving said opening singly or one at a time.

What I claim is:

1. A target projecting machine comprising a hopper, a tube extending into the said hopper from below the same, means for pro-

jecting a movable object through said tube, and means for closing at a predetermined point, the discharge portion of said tube.

2. A target projecting machine comprising a hopper, a tube, means for projecting a movable object through said tube, the hopper being in position to receive the movable object on its descent, and means for closing the discharge portion of said tube, at a predetermined point.

3. A target projecting machine comprising a hopper, a tube, means for projecting a movable object through said tube, the hopper being in position to receive said movable object on its descent, means for conducting said object from the hopper to a point where it can be projected through said tube, and means for positively clearing the discharge end of said hopper.

4. A target projecting machine comprising a hopper, a pipe depending from said hopper, a tube, means for projecting a movable object through said tube, the hopper being in position to receive said movable object on its descent, means for conducting the movable object from the pipe to a point where it can be projected through said tube, and means for positively sweeping across the outlet of said hopper.

5. A target projecting machine comprising a tube, a support for an object, means for forcibly impelling said object from said support through said tube, a container into which the object falls, a pipe depending from said container, a rest for receiving the object from said pipe, and means for conducting said object from said rest to said support.

6. A target projecting machine comprising a tube, a support for an object, means for forcibly impelling said object from said support through said tube, a hopper into which the object falls, a pipe depending from the hopper, a rest for the object after it passes from the pipe, and mechanism for closing the discharge end of said pipe, and for also conducting the object from said rest to said support.

7. A target projecting machine comprising a passage, a support for an object, means for forcibly impelling said object from said support through said passage, a container into which the object falls, a rest, a duct for conveying the object from said container to said rest, and means including an object forwarding device for positively moving the object away from said duct and for guiding the same toward said support.

8. A target projecting machine comprising a passage, a support for a movable object, means for forcibly impelling said object through said passage, a hopper into which the object falls, a duct leading from said hopper for the passage of said object, a rest at the delivery end of the duct onto

which said object is adapted to pass from said duct, an object forwarding device, means for operating said object forwarding device to move the object from said rest, and a way leading from the rest to said support and along which said object is adapted to travel.

9. A target projecting machine comprising a passage, a support for a movable object, means for forcibly projecting said object through said passage from said support, a hopper into which the object is adapted to fall, a duct for leading the object from the hopper, a rest onto which the object is adapted to pass from said duct, an object forwarding device for shifting the object from said rest and for causing its movement toward said support, said object supporting device having a valve for closing the outlet of said duct on the working movement of said forwarding device.

10. A target projecting machine comprising a passage, a support for a movable object, means for forcibly projecting said object through said passage from said support, a hopper into which the object is adapted to fall, a duct for leading the object from the hopper, a rest onto which the object is adapted to pass from said duct, an object forwarding device for shifting the object

from said rest and for causing its movement toward said support, said object supporting device having a valve for closing the outlet of said duct on the working movement of said forwarding device, said duct having a valve member adapted to be swept by said forwarding device.

11. A target projecting machine comprising a passage, a support for a movable object, means for forcibly projecting said object through said passage from said support, a hopper into which the object is adapted to fall, a duct for leading the object from the hopper, a rest onto which the object is adapted to pass from said duct, an object forwarding device for shifting the object from said rest and for causing its movement toward said support, said object supporting device having a valve for closing the outlet of said duct on the working movement of said forwarding device, and means for positively preventing the hopper from being clogged at its outlet.

In testimony whereof I affix my signature in presence of two witnesses.

IRA L. REEVES.

Witnesses:

WILLIAM O. CUTLER,
ELLA H. JACOBS.