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TARGET PROJECTING DEVICE WITH MAGAZINE INDEXING MECHANISM

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Fig. 1

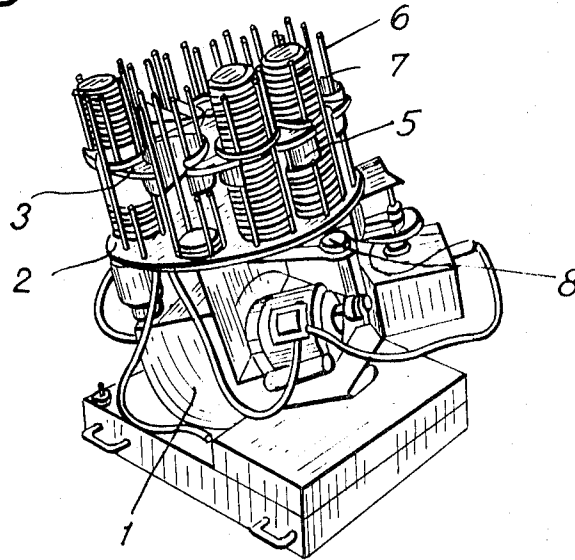
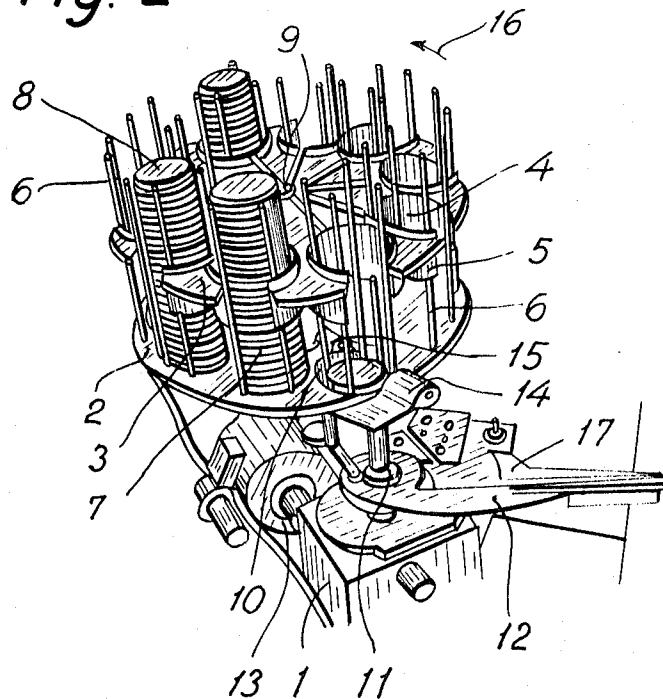


Fig. 2



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TARGET PROJECTING DEVICE WITH MAGAZINE INDEXING MECHANISM

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2 Claims

ABSTRACT OF THE DISCLOSURE

A target trap with a revolvable magazine has a plurality of circularly arranged stacks of clay pigeons which can be successively brought into position above an aperture provided in a plate supporting the stacks and hence down upon the throwing arm of the trap, the magazine being revolved in stages by means of an electromotor controlled by photocell means mounted with the line of sight above the aperture so that the electromotor is started when the line of sight is unbroken as the last clay pigeon of a stack is lowered into position beneath the level of the plate.

BACKGROUND OF THE INVENTION AND DESCRIPTION OF THE PRIOR ART

In the known apparatus of the aforesaid kind the magazine of clay pigeons is moved by the throwing arm by means of a mechanical transmission mechanism, the magazine being at each movement of the throwing arm moved a step corresponding to a partial revolution and the number of steps being equal to the number of stacks. Thus, at each movement of the magazine a new stack is brought into position above the aperture in the supporting plate and consequently above the throwing arm, and the lowermost clay pigeon of the stack located above the throwing arm is transferred to the said arm, after which the stack is moved further on.

In this known design a part of the spring power moving the throwing arm has to be utilized for moving the magazine, which is relatively heavy, particularly when filled with clay pigeons, and this reduces the throwing capacity of the apparatus.

In operation it is important that a clay pigeon is ejected whenever the apparatus is activated, and all the stacks must therefore contain an exactly equal number of clay pigeons, and if the stacks are being depleted at the end of the target practice and a few additional clay pigeons are to be used, it is necessary to distribute these exactly in the stacks.

SUMMARY OF THE INVENTION

According to the invention there is provided a trap for ejecting disc-shaped members, so-called clay pigeons, for use in target practice. The said trap consists of a frame wherein a throwing arm pivotable around an upwardly inclining axis is adapted to be swung outwards by means of a spring from a position in which the throwing arm is locked to the frame so as to throw out the clay pigeon, which is transferred to a depositing surface on the inner end of the arm from a magazine which is provided above the throwing arm and receives a number of circularly arranged stacks of clay pigeons and which is adapted to be revolved around a central axis so that the stacks may successively be brought into position above an aperture provided in a fixed supporting plate carrying the stacks and above a feeding mechanism adapted to support the stack and to pass the lowermost clay pigeon onto the depositing surface of the throwing arm, wherein the magazine is connected with an electromotor adapted to move

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the magazine in steps each corresponding to a partial revolution and the number of steps corresponding to the number of stacks, the said electromotor being controlled by photocell means mounted at the aperture of the supporting plate and adapted to start the motor when there is no clay pigeon opposite the said photocell means.

BRIEF DESCRIPTION OF THE DRAWING

An embodiment of a target trap according to the invention will now be described with reference to the drawing, in which

FIG. 1 is a side view of the apparatus in perspective, and

FIG. 2 is a perspective view of the apparatus of FIG. 1 viewed from another angle and in another condition.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The apparatus has a frame 1 with a fixed supporting plate 2 carrying a clay pigeon magazine consisting of a plate 3 which is parallel with the supporting plate 2 and which has ten circularly arranged apertures 4, each provided with an open sleeve 5 to which are attached four rods 6 forming guides for a stack 7 of disc-shaped clay pigeons 8.

The said magazine is attached to a central shaft 9 connected with an electromotor (not shown) which is adapted for stepwise rotation of the shaft and consequently of the magazine. Each step corresponds to one-tenth of a revolution so that at each stepwise movement the stacks change their position on the supporting plate 2, the lowermost clay pigeons sliding on the supporting plate at the said movement.

The supporting plate 2 has an aperture 10 beneath which there is a mechanism of known kind, not further described since it forms no part of the present invention. The mechanism is partially driven by a cam 11 provided on the throwing arm 12 of the apparatus, the said arm 12 being driven by a spring (not shown) in order to perform the throwing movement and it is moved into its starting position by means of an electromotor 13. The mode of operation of the feeding mechanism and the throwing arm will be evident from the following description of the operation of the apparatus.

Above the supporting plate 2 and opposite the aperture 10 are provided photocell means 14 and 15, which, as appears from FIG. 2, have a line of sight located at the outer edge of the aperture 10. The direction of rotation of the magazine is indicated by an arrow 16.

The apparatus operates as follows: In the operating position there is a stack 7 of clay pigeons 8 above the aperture 10 of the supporting plate 2, and there is a number of clay pigeons beneath the supporting plate in the feeding mechanism (not shown). The said feeding mechanism has primarily members adapted to support the stack of clay pigeons and to release the stack, thus permitting it to sink as much as corresponds to the thickness of a clay pigeon. The mechanism further comprises means for passing the lowermost clay pigeon onto the inner end of the throwing arm which is indicated in FIG. 2 and denoted by 17. The apparatus is in its starting position when the arm has been passed into the position indicated in FIG. 1, which shows a clay pigeon 8 resting on the part 17 of the arm. In this position the spring of the throwing arm is tensioned and as soon as the operator causes the apparatus to give off a control pulse, the arm will in known manner perform the throwing movement, the conclusion of which is shown in FIG. 2, and will then, while tensioning the spring, be returned by the action of the electromotor to the position indicated in FIG. 1, in which the arm is locked to the frame. By the swinging movement of the arm, movements are trans-

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mitted through the cams to the control means for the clay pigeons, so that the stack is lowered and a new clay pigeon is passed onto the throwing arm.

The height of the stack 7 will be decreased as the clay pigeons are ejected, and at last the clay pigeons located directly above the supporting plate 2 will move into the aperture 10, after which the photocell means 14, 15 can communicate, and as a result a pulse is transmitted to the electromotor for the magazine which then moves through a one-tenth revolution so that the next stack or the control means 6 thereof are passed into position above the aperture 10. The movement of the magazine may be stopped thereby that the photocell means 14, 15 transmit a pulse for stopping the electromotor as soon as the lowermost clay pigeon of the next stack cuts off the connection, but the movement may also be stopped by other means.

The magazine will subsequently remain stationary until the next stack has been used, and as appears from the foregoing description the stacks may be of any height whatever, that is, contain different numbers of clay pigeons, and also there may be stack chambers that are completely empty, since the photocell means 14, 15 will cause the magazine to continue rotating until a clay pigeon or a stack of clay pigeons is brought into position above the aperture 10.

In the embodiment described the magazine is moved by a separate motor so that the throwing arm loses no power for moving the magazine, and the magazine is moved substantially fewer times than the known apparatus, that is, whenever a stack located above the aperture in the supporting plate is empty, the photocell means reacting when the last clay pigeon has been removed from the supporting plate.

A very essential advantage of the apparatus according to the invention is that the clay pigeons may be arranged in the magazine wholly arbitrarily, that is, in different numbers in the different stacks, and when the magazine is being emptied, a smaller or larger stack of clay pigeons may quickly be provided at the place located directly in front of the aperture in the supporting plate. Since the supporting plate is rotated whenever the photocell means is registering that there is no clay pigeon above the throwing arm, there is little risk of the apparatus performing a throwing movement without a clay pigeon.

I claim:

1. In a trap for ejecting disc-shaped members in target

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practice and having a frame with a throwing arm pivotable around an upwardly inclined axis and adapted to be swung outwards from a position in which the throwing arm is locked to the frame for ejecting discs one by one, the discs being transferred to a deposition surface on the inner end of the arm by means of a feeding mechanism adapted for supporting a stack of discs and feeding the lowermost disc onto the depositing surface of the throwing arm, an improvement comprising a magazine disposed above the throwing arm and including guide means for stacking discs in a number of circularly arranged stacks, a fixed supporting plate disposed beneath said magazine and above the throwing arm, said magazine being located above said fixed plate with the stacks of discs resting thereon, and said guide means holding the stacks throughout their height on the plate, said magazine further including a rotatable plate fixedly secured to said guide means above the fixed plate, an independent drive means for stepwise rotating the rotatable plate of the magazine around a central axis about which the circularly arranged stacks are concentric so that the stacks slide on the fixed plate and are successively brought into position above an aperture provided in said fixed supporting plate and above the feeding mechanism, said drive means rotating the rotatable plate in rotation steps corresponding to the number of stacks, and photocell means controlling the operation of said drive means, said photocell means being mounted at the aperture of the supporting plate for starting the drive means when there are no discs at the level of the photocell means.

2. An improvement as claimed in claim 1 wherein said independent drive means is a separate step drive motor directly coupled to the magazine to rotate the same in steps.

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W. R. BROWNE, Assistant Examiner

U.S. Cl. X.R.

221—11; 124—47, 48