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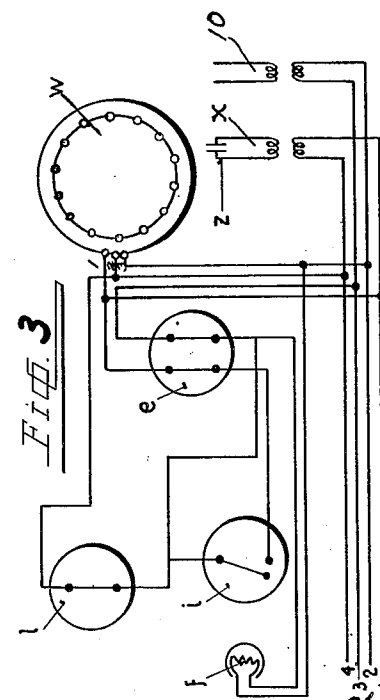
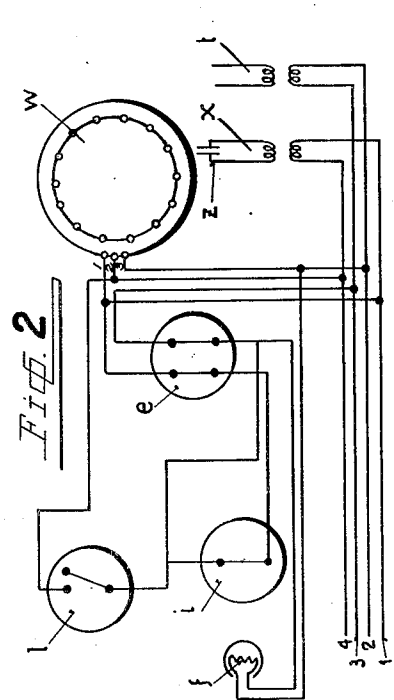
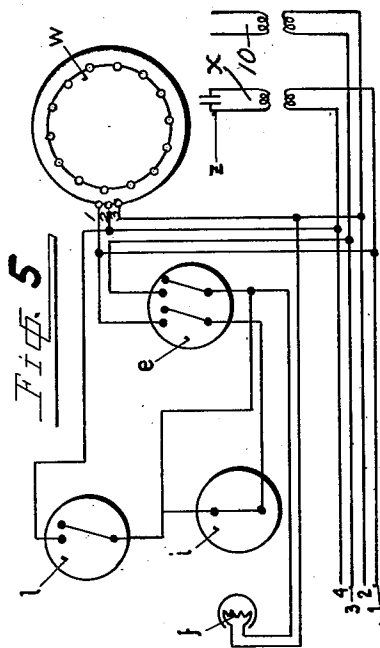
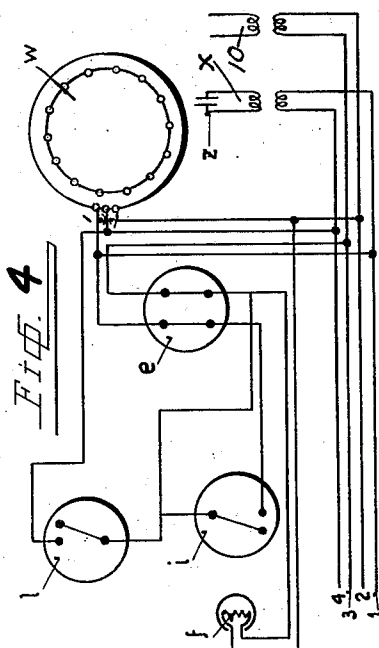
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MINIATURE RIFLE RANGE

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2 Sheets-Sheet 2



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MINIATURE RIFLE RANGE

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5 Claims. (Cl. 194—9)

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When shooting with loaded shooting devices, the operator has hitherto been forced to leave his shooting position to check the point where the projectile hit and, in case plugs were used, to fetch them back again. This disadvantage is eliminated in the miniature rifle range according to the present invention which can be set up indoors or in the open. This simplification increases the fun of shooting and is helpful for training purposes.

The miniature rifle range according to the present invention comprises a traveling carriage which is provided with an electric motor and is movable back and forth on a rail. On the front of the traveling carriage there is mounted a target which rests against a backing plate and which, when struck by a projectile, inclines backward together with the backing plate. This movement causes the throwing of a tumbler switch which closes the circuit to the motor and thus sets the motor and traveling carriage in motion so that the latter travels to the point where the shooter is standing and is held there by a cut-out device.

The range is provided with a coin slot arrangement and is intended for hotels, restaurants, etc. This arrangement obliges the shooter to insert a coin before being able to fire a certain number of shots. One particular embodiment, for example, may permit the carriage to travel back and forth three times after a particular coin is inserted. It may also be arranged for the firing of more or fewer shots, i. e. for more or fewer back and forth travels of the carriage.

The range may be made of different suitable sizes, depending on whether the device is to be used indoors or in the open. Targets of about 4 or 5 square inches are suitable for small ranges, and the dimensions may be correspondingly larger for ranges of greater size.

In the drawings,

Fig. 1 is a side view of one embodiment of the present invention showing the movable target carriage mounted on a table or platform.

Fig. 2 shows the positions occupied by the tumbler switch during the rearward travel,

Fig. 3 shows the positions occupied by the tumbler switch during the forward travel.

Fig. 4 shows the positions of the tumbler switch when the traveling carriage is at rest at the far end, and when in front where the rifleman is standing.

Fig. 5 shows the positions of the tumbler switch after depression of the press button at the front end before a coin is inserted.

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The motor *w* is supplied with current by means of four bare metal bars 1, 2, 3, 4 secured alongside the traveling rail 5. The current is conveyed from the rails to the motor by sliding current tapping shoes not shown.

The motor *w* is a single phase, low voltage, squirrel cage induction motor and it is connected direct to the lighting mains. When the voltage is too high, the current must be reduced or transformed to from 6 to not more than 24 volts in order to comply with the regulations against danger in games.

The equipment may also be driven by storage batteries if the motor is a D. C. one.

As can be seen from Figs. 2 to 5, motor *w* receives driving voltage via a 220/24 volt transformer 10. The two tumbler switches 1 and 2 serve for switching over. Tumbler switch 1 effects the forward motion, and tumbler switch 2 the rearward motion. The phase displacement necessary for starting the motor *w* is effected by an additional 220/24 volt transformer *x* in association with a blocking condenser *z*.

The traveling carriage 7 having wheels 6 for running on rails 5 is at first at the position where the shooter is standing (Fig. 5). The rifleman inserts a coin in the slot channel *a* which is dimensioned so that the coin can drop freely. When dropping, the coin strikes against lever arm *b* which is pivoted at the top end. This impact causes the lever arm *b* to swing out by a few tenths of a millimeter counter to the action of a spring. Lever arm *b* is provided with a locking lug *c*. Opposite to it there is a falling pawl *d* whose front end is held engaged by the locking lug *c* until the dropping coin swings out lever arm *b*. This movement causes the falling pawl *d* to slip, under control of a spring, from locking lug *c* and to strike against a projecting cam 11 on the bipolar tumbler switch *e* which is tilted by this impact. The bipolar tumbler switch *e* effects the closing of the circuit to the motor across the connected-in tumbler switch *i* (Fig. 2). By means of the same tumbler switch *e*, and at the same moment, the lamp *f* which illuminates the target is connected-in and the carriage immediately travels to the far end of the rail where it is stopped. Tumbler switch *e* remains in the thrown position until the carriage has traveled back and forth three times as explained hereinafter.

The carriage is stopped at the far end of the rail in the following manner:

At the front of the carriage there is a pressure lever arm *g* provided with a press button

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and pivotable on shaft *v* attached to the carriage. When the carriage is traveling to the far end, lever arm *g* is inclined downward in the position shown in the drawing by an arrow over the press button. A raised wedge-shape member *h* is mounted at the far end of the rail 5. When the carriage travels over this elevation *h* the downwardly inclined pressure lever arm *g* slides over the elevation *h* and is thus swung upward. This movement causes the pressure lever arm *g* to engage with a projecting cam 12 of tumbler switch *i*. This causes tilting of tumbler switch *i*, opening of the circuit to motor *w*, and stopping of the carriage (Fig. 4).

A shot can now be fired. When the projectile strikes the target, the impact pushes the target with its backing plate *k* rearwards. This movement causes the tilting of tumbler switch *l* (Fig. 3), thus closing the circuit to motor *w*, and the carriage travels forward to the place where the rifleman is standing and is stopped there.

The carriage is stopped at the shooter's position in the following manner:

The target's backing plate *k* is pivotable on shaft *m* attached to the carriage. A flat bend *n* extends rearward at right angles from this pivotal point of shaft *m*. When the circuit is closed, this bend is inclined a few degrees downward, and the target's backing plate *k* a few degrees rearward. At the front end of the rail there is a wedge-shape elevation *o*. When the flat bend *n* passes over the elevation *o*, the downwardly inclined bend *n* is pushed upward and the target's movable backing plate is pushed forward. This movement causes tilting of tumbler switch *l*, interruption of the circuit to motor *w* and stopping of the carriage (Fig. 4). When the shot has been checked, the rifleman presses the button on pressure lever arm *g*, thus inclining this lever arm downward. This movement causes the tilting of tumbler switch *i* (Fig. 2), thus closing the circuit to motor *w*, and the carriage travels back to the far end of the rail where it is again stopped. Another shot can now be fired.

When the carriage has reached the rifleman's position for the third time and the shot has been checked, he presses the button on lever arm *g*. This movement of lever arm *g* causes the tilting of tumbler switch *i*, thus closing the circuit to motor *w*, but the carriage is now blocked and does not travel.

This is effected in the following manner:

Near tumbler switch *e* there is installed a pair of toothed wheels *p* and *q*. Toothed wheel *p* has nine teeth while toothed wheel *q* has only three teeth but it also has three lifting cams *u* which serve for lifting the falling pawl *d* on to the locking lug *c*. The two toothed wheels are fastened together and they rotate together on the same shaft in clockwise direction. Each pressure on the pressure lever arm *g* causes the pair of toothed wheels *p, q* to rotate to the extent of one tooth of toothed wheel *p*. When the pressure lever arm *g* has been pressed down twice, this means that the carriage has traveled back and forth on the rail twice. One tooth of toothed wheel *q* now stands in front of the bipolar tumbler switch *e*. When the pressure lever arm *g* is pressed down for the third time, the lifting cam *u* strikes against an edge 17 of the falling pawl *d* and lifts it, and then slides further along and drops the front end of falling pawl *d* on to the locking lug *c*. The bipolar tumbler switch *e* is tilted by a tooth of toothed wheel *q* acting on

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projecting pins 16 on switch *e*, thus opening the circuit to motor *w*, and the lamp is extinguished and the carriage blocked (Fig. 5). The shooter has to insert another coin to permit the carriage to travel again.

The coin slot device may also be designed for more or fewer shots, i. e. for more or fewer travels of the carriage, by providing more or fewer teeth on toothed wheel *p* which determines the number of travel times of the carriage.

If for any reason the impact of the projectile should not close the circuit, a pull lever *r* is provided at the shooter's position; a cable *s* extends to the far end of the rail and is secured to a movable pawl *t* which pulls the bend *n* downward when the pull lever *r* is pulled, and tilts tumbler switch *i*, thus closing the circuit to motor *w*, and the carriage travels to the shooter's position.

What I claim is:

1. A miniature rifle range comprising a track, a carriage movably mounted on said track, electric drive means for moving said carriage on said track, energizing means for said drive means, a backing plate having a target thereon pivotally mounted on said carriage, a tumbler switch mounted on said carriage and operatively connected to said backing plate, said tumbler switch being electrically connected to said drive means for energization thereof, cut off means for said drive means at each extremity of said track, and release means for preparing a circuit for said energizing means.

2. A miniature rifle range as claimed in claim 1, said release means comprising a coin channel, a lever arm pivotally mounted on said carriage and having the free end thereof positioned in said coin channel, a locking lug on said lever arm, a falling pawl pivoted on said carriage and having the free end thereof in normal contact with said locking lug, a bipolar tumbler switch mounted on said carriage in proximity to said falling pawl, said switch being electrically connected to said drive means, whereby upon insertion of a coin in said coin channel said lever arm is moved, releasing said falling pawl and actuating said switch whereby said drive means are energized and said carriage is moved along said track.

3. In a miniature rifle range as claimed in claim 2, means for predetermining the number of movements of said carriage along said track comprising a smaller and a larger toothed wheel rotatably mounted on said carriage in proximity to said falling pawl, said toothed wheels being secured together for rotation together, said smaller wheel having a greater number of teeth than said larger wheel, a plurality of lifting cams on said larger wheel for coaction with said falling pawl for lifting said pawl, the teeth on said larger wheel being contactable with said bipolar tumbler switch for actuation thereof, said energizing means for said drive means comprising a pivotally mounted lever, a free end of said lever contacting the teeth on said smaller wheel for rotating said wheels and lifting said falling pawl by means of said lifting cams after a predetermined number of movements of said lever, and said teeth on said larger wheel actuating said bipolar tumbler switch to place the same in inoperative position after the said predetermined number of actuations of said lever.

4. In a miniature rifle range as claimed in claim 1, said backing plate having a flat bend projecting thereon at right angles to said backing plate,

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said cut off means for said drive means comprising wedge-shaped members, said flat bend portion of said backing plate coacting with said wedge-shaped elements upon movement of said carriage to actuate said tumbler switch operatively connected to said backing plate whereby upon reaching the backward limit on said track said tumbler switch will disconnect said drive means and stop said carriage.

5. In a miniature rifle range as claimed in claim 1, said backing plate having a flat bend portion projecting therefrom at right angles thereto at the lower end of said backing plate, a lever pivotally connected to said track, a cable connected to said lever and extending rearwardly along said track, a movable pawl secured to said track and operatively connected to said cable at a point remote from said lever, said movable pawl being contactable with said flat bend portion of said backing plate upon movement of said lever whereby upon movement of said lever said movable

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pawl will move said flat bend portion of said backing plate and said tumbler switch controlling said drive means will be actuated for energizing the drive means and causing movement of the carriage.

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