

PATENT SPECIFICATION

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709,259

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COMPLETE SPECIFICATION

Improved Toy Gun

We, BRITAINS LIMITED, a Company organised under the laws of Great Britain, of Sutherland Road, Walthamstow, London, E.17, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

5 This invention relates to toy cannons of the type having a barrel adapted to receive a cartridge element together with a missile, the missile being discharged from the cartridge by a spring actuated 10 striker which, on firing the cannon, makes impact with the missile under the impelling force of its spring, detent mechanism being provided for holding the striker in its loaded position until released, by 20 actuation of a trigger device, to fire the gun.

In the specification of our prior Patent No. 617,492, the firing mechanism comprises a striker having retractile fingers adapted when the cartridge is loaded or 25 primed, to engage a shoulder in the base of the cartridge. Actuation of the striker i.e. its release is effected by means of a trigger mechanism incorporated in the breech end of the barrel which operates 30 to disengage the fingers from the said shoulder.

The present invention is concerned with an improvement or modification of the toy 35 cannon, the subject of the parent Specification No. 617,492, the main object being to provide an improved construction of striker and firing mechanism.

Another object of the invention is to 40 provide an improved and more realistic design of gun carriage, so that during the firing the carriage can be lowered to the ground. A further object of the invention is to provide an improved construction 45 of trigger mechanism to enable the striker to be more readily released.

According to the present invention we [Price 2/8]

provide a toy cannon and cartridge element in which the cartridge element comprises a case or outer sleeve and a spring 50 actuated striker mounted within the case, the striker being formed with a rigid extension or tail adapted when the actuating spring is compressed and the striker is bodily displaced releasably to engage a 55 retaining shoulder in the sleeve or case and the trigger mechanism of the cannon being provided with means for displacing and thereby disengaging the striker from 60 the shoulder.

Conveniently the retaining shoulder in the case is provided by means of a cup-shaped insert, the insert having a flange, by which the case is located within the 65 barrel and also being provided with a bottom opening to receive the tail piece of the plunger.

According to a further feature of the invention, the barrel of the toy cannon is 70 supported on a carriage having a bogie suspension at the barrel end and provided at its trail end with trailer wheels, which bogie suspension is mounted so as to be 75 capable of movement into and out of a firing position where the cartridge rests in engagement with the ground.

The trailer wheels are preferably releasably secured to the carriage, which may 80 comprise a platform having trail arms hingedly attached thereto, and which in the normal or travelling position are fixed one to the other.

The invention is illustrated in the accompanying drawings, in which Figure 1 is a view in elevation of a toy cannon 85 having an improved design of carriage and wheel mounting in accordance with the invention, and also incorporating the modified trigger and firing mechanism of this invention. Figure 2 is a horizontal 90 sectional view on an enlarged scale showing the breech end of the barrel with a shell case in position prior to firing.

Figure 3 is a separate view showing the

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shell case with the parts in their position after the shell has been fired to release the striker R.

Figure 4 is diagrammatic detail view showing the wheel suspension in travelling and static or firing position. Figure 5 is an inverted plan view on an enlarged scale showing the trail portion of the carriage. Figure 6 is a part-sectional view showing the rear-wheel mounting. Figure 7 is a detail view taken end-on of the gun showing the barrel locking device. Figure 8 is a part-sectional view showing means for supporting the breech end of the barrel when in the travelling position.

Referring more particularly to Figures 1 to 5 of the drawings, there is shown a toy cannon comprising a carriage indicated at C, and mounting a barrel B which is carried on trunnions T. Depression and elevation of the barrel is by means of worm operated elevating gear indicated at E. F indicates the firing mechanism. Carriage C is provided with wheels W and when travelling the trail end is suspended on additional wheels W¹.

The cannon is designed to fire a shell like missile M (see Figure 2) the energy to propel the shell being obtained by means of a striker R in a shell case S.

In the toy cannon of this invention, the modified striker R comprises a plunger 1 having an enlarged head 2, which is a loose sliding fit in one end of a sleeve 3 constituting the shell case, the sleeve 3 at its other end being provided with a retaining flange 4 by means of which the shell case is located in the breech end of the barrel.

For convenience in manufacture, the sleeve 3 at the firing end is fitted with a cup-shaped insert 5 having a central aperture 6 to receive a tail 7 on the end of the plunger 1. The cup piece 5 is formed with a circumferential lip to provide the locating flange 4. Within the sleeve 3 is a compression spring 15 which at one end is located by the cup member 5 and at its other end engages behind the head 2 of the striker.

It will be seen that the tail 7 has a nose piece or rounded end 10 for co-operation with a similarly shaped recess 11 provided in a firing pin 12 mounted in a recess 13 formed in a breech block 14.

At the breech end of the barrel B are laterally projecting brackets 16 mounting a pivot pin 17 (see Figure 2), on which is hingedly carried the breech block 14. This enables the breech block 14 to be swung to the open or loading position (shown in dotted lines in Figure 2) to enable the missile M and shell case S to be loaded. In its closed or firing position,

the breech block 14 is locked tight to the barrel by means of a latch arm 18 having a spiggotted end 19 mounted to swivel about a horizontal axis indicated at 20 in Figure 2.

As can be seen from Figure 2 the latch arm 18 has an intermediate loop 21, which, when the arm is raised to the vertical position overlaps a lug 23 on the breech block 14 and by means of the latter is locked in its firing position.

The mounting of the breech block is by means of a bracket 25 in which is a hole to receive the journal pin 17, the bracket 25 being extended rearwardly and parallel to the axis of the gun to provide a shell case ejector arm 27.

The arm 27, when the breech block 14 is opened to reload, swings into and through a slot 28 (see Figure 2) in the barrel to engage flange 4 at the base of the shell case S and thereby eject the cartridge, this action being indicated by the dot and peck lines.

A spring 30 is provided to hold the firing pin 12 in its inoperative or withdrawn position, this spring being located by an internal shoulder formed at the inner end of the recess 13 and engaging a flange 31 on the opposite end of pin 12. Firing is by means of a firing lever including a central spindle 32 having at one end a firing arm 33 and at its other end a short up-turned arm or stud 34. The firing lever is journaled by its spindle 32 to rock about a horizontal transverse axis in the breech block 14, so that when firing arm 33 is pushed forwardly in direction of its arrow *x* (see Figure 1) it will rock the spindle and the short arm will move forwardly and act as a cam to force the firing pin against its spring so that it enters the interior of the cup 5. The recess 11 in the end of the firing pin will then embrace the nose 10 of the plunger 1.

This results in the plunger 1 being centralized and as soon as the tail has moved clear of the opening in the base of the cup, it will be free to move forward under the action of its spring.

In order to fire the cannon, a missile M is first inserted in the breech end of the gun, followed by a shell case S, the shell case having previously been primed. In priming the shell case S, pressure is applied to the plunger head 2 in the direction of the arrow *y* (see Figure 3) so as to force the plunger into the position in which it appears in Figure 2 where the spring 15 is compressed. By reason of the head 2 of the piston being a loose fit, it permits of sideways play of the tail end 7, so that when the shell S is primed, the shoulder provided by the tail piece 7 will engage the sides of the opening 6 in the

bottom of the cup in a manner similar to the lugs 16 of the parent specification.

To facilitate priming the shell we may provide a loader into which the shell case fits and in the bottom of the loader is a projection which is off-centre, i.e. eccentric to the axis of the case. When the head 2 encounters the projection it is pushed over sideways which forces the tail piece 7 to engage the sides of the opening 6.

It will be obvious therefore that when the firing pin 12 is forced forwardly by the firing arm 33, the recess 11 will centre the nose 10 of the tail piece 7 to enable it to pass through the opening 6, when under the action of its spring 15 it will fly forwardly and strike the missile M.

To enable the gun to traverse, the barrel B, including the elevating gear, is mounted on a table 40, which in turn is rotatably carried by a ground platform 41 forming part of the carriage C, the platform 41 (see also Figure 5) having rearwardly extending legs or arms 43 forming the trail of the gun, these arms 43, when the gun is in its firing position and the platform 41 has been lowered to the ground being moved apart from one another to the position shown in dotted lines in Figure 5.

In the travelling position, the arms 43 are rigidly held one against the other by means of a transverse member 44 which is provided with upwardly and inwardly inclined struts 45 (see also Figure 8) which are united one with the other to provide a pedestal support 46 to support and retain the rear end of the barrel, as hereinafter explained.

On the under side of the triangular support frame, saddle or strap formed by the members 44, 45—45 are studs 47 for engagement with holes 48 in the arms 43, so that when the arms 43 are in the travelling position as shown in full lines in Figure 5, they will be locked firmly one against the other. In this position, the barrel B is withdrawn in relation to a slide 90, hereinafter to be described, and in order to locate the barrel and to hold the latter, together with the platform 40, against traversing, there is provided on the breech end of the gun, a V-shaped projection 49 which is centred by the pedestal.

When in the travelling position as shown in Figure 1, the arms 43 are raised off the ground and carried by an independent bogie unit comprising wheels 60 mounted on opposite ends of a bolster 61 integral with which is an axle piece 62 having down-turned ends 63. Journalled in the platform 61 is a vertical spindle 64, on the upper end of which are capstan arms 65. Mounted on the lower end of the

spindle 64 is a collar 66 which is held in position by a plate 67, the distance between the plate 67 and the underside of the platform being sufficient to accommodate the vertical width of the arms 43. As shown in Figure 6 in each of the opposite inner faces 43¹ of the arms 43 is a groove 68, in which groove 68 fits the collar 66, so that when the arms 43 are assembled in their travelling position the bogie unit is held in position in such a manner as to permit the wheels 60 to swivel about the spindle and to act as steering wheels.

To enable the cannon to be towed in this position, there is provided a tow bar 70, having a loop at its towing end and each limb 71 of which is formed with out-turned ends 72 to provide stub axles for mounting the wheels 60, these axle pieces 72 being fixed in slots formed between the forked ends of the arms 63.

The carriage at its platform end is supported by a bogie unit comprising a bogie frame having side members 80, mounting axles 82—82¹, carrying the wheels W. The bogie frame is pivotally suspended from the base platform 41 of the carriage by means of a cross pin 83, the position of the pivotal axis 83 being located in a plane above that passing through the wheel axles W. The bogie is retained in this position by reason of the side plates of the platform 41, each being cut away as at 84 to provide a vertical recess, to receive the axle 82¹ of the front pair of wheels (viewed in relation to Figure 1) when the carriage is in its travelling position. It will be appreciated therefore that most of the load of the platform and gun carriage is taken by the axle 82¹ so that it will remain in this position, because the fulcrum 83 for the bogie is located on a plane above the centres of the wheel axles.

In the firing position the load is taken off the wheels W and the platform 41 dropped to ground level. To do this, it is first necessary to lift the carriage C bodily, so that the entire bogie can be swung about its fulcrum 83 to the dot and dash line position shown in Figure 4, that is in a clockwise direction about the fulcrum 83 and until further movement of the bogie is arrested by the axle 82 engaging the upper surface of the platform 41. In this position it will be seen that the wheels W are clear of the ground, so that the load is directly transmitted from the traversing table 40 to the ground platform 41 and there will be no load on the bogie. A stud or studs 87 may be provided, behind which the axle 82 engages in order to hold the bogie in its unloaded (firing) position.

It will be obvious that any attempt to traverse the gun with the barrel in the position shown in Figure 1, will be impossible when the gun is elevated, because its breech end would foul the carriage arms 43. It will be understood therefore that the position of the barrel B in Figure 1 constitutes the travelling position, where, in order to prevent the gun being top-heavy, the barrel is withdrawn and supported by the support 46. For this purpose, the barrel B is adjustably carried for movement in an axial direction on its slide 90 and which may comprise a part 91 (see also Figure 7) integral with the underside of the barrel B which part is slidable in grooves 92 in a cradle 93 on the platform 40.

In order to lock the barrel B respectively in its travelling and firing position, there is provided a catch 94 having a finger release pin 95, the nose 96 of the catch being adapted to enter one of two recesses 97 in the under part 91.

In use, in order to prepare the gun for firing, the carriage C is dropped to ground level, first by moving the main bogie to the dotted line position as described and shown in Figure 4, so that the ground platform 41 is resting on the ground, following which the trail wheels 60 are dismantled and the arms 43 moved apart to the position shown in Figure 5. To do this, it is necessary first to release the barrel catch 93, so as to enable the barrel to be disengaged from the support 46 and run forwardly, when the barrel by application of the catch 93 can be locked in the firing position. Removal of the frame 44—45 releases the arms 43. The gun is now ready for firing.

Loading and firing, etc., takes place as already described by insertion of the missile M together with a shell case S, as already described in connection with Figures 1—3.

What we claim is:—

1. An improvement or modification of the toy cannon and cartridge element claimed in Patent Specification No. 617,492, in which the cartridge element comprises a case or outer sleeve and a spring actuated striker mounted within the case, the striker being formed with a rigid extension or tail adapted when the actuating spring is compressed and the striker is bodily displaced releasably to engage a retaining shoulder in the sleeve or case and the trigger mechanism of the cannon being provided with means for displacing and thereby disengaging the striker from the shoulder.

2. A toy cannon and cartridge element as claimed in claim 1 in which the case or outer sleeve has a central opening at

the rear to receive a nose piece on the tail of the striker.

3. A toy cannon and cartridge element as claimed in claim 2 in which the case or outer sleeve is provided with a cup shaped insert having a flange for locating the sleeve in the barrel and a bottom opening through which the tail piece is projected on loading.

4. A toy cannon and cartridge element as claimed in claims 2 or 3 in which the trigger mechanism is provided with a curved recess shaped to fit the nose piece on the tail of the striker plunger.

5. A toy cannon and cartridge element substantially as described with reference to Figures 2 and 3 of the accompanying drawings.

6. A toy cannon and cartridge element as claimed in any one of the preceding claims in which the barrel of the toy cannon is supported on a carriage having a bogie suspension at the barrel end and provided at the trail end with trailer wheels, which bogie suspension is mounted so as to be capable of movement into and out of a firing position where the carriage is in direct engagement with the ground.

7. A toy cannon and cartridge element as claimed in claim 6 in which the trailer wheels are releasably secured to the gun carriage.

8. A toy cannon as claimed in claim 7 in which the carriage comprises a platform, arms hingedly attached to the platform and means for releasably securing said arms one to the other.

9. A toy cannon and cartridge element as claimed in claim 8 in which the action of releasing the arms also releases the trailing wheels.

10. A toy cannon and cartridge element as claimed in claims 8 or 9 in which the axle piece mounting the trailer wheels is provided with a fulcrum post and the arms at their rear ends are recessed to receive said post.

11. A toy cannon and cartridge element as claimed in claim 10 wherein the fulcrum post is provided with a sleeve to fit the recess in the carriage arms, whereby the trailer wheels are freely mounted to facilitate steering.

12. A toy cannon and cartridge element as claimed in any of the foregoing claims in which the barrel is slidably mounted in the carriage and means is provided for locking the barrel in its travelling and firing position.

13. A toy cannon and cartridge element as claimed in any one of claims 8 to 11 in which the fixing means for the arms comprises a saddle or strap having pins adapted to enter into holes in the arms and in which the saddle is adapted to pro-

vide a support for the barrel, when in the travelling position.

14. A toy cannon and cartridge element substantially as described with reference to Figures 1, 4, 5, 6, 7 and 8 of the accompanying drawings.

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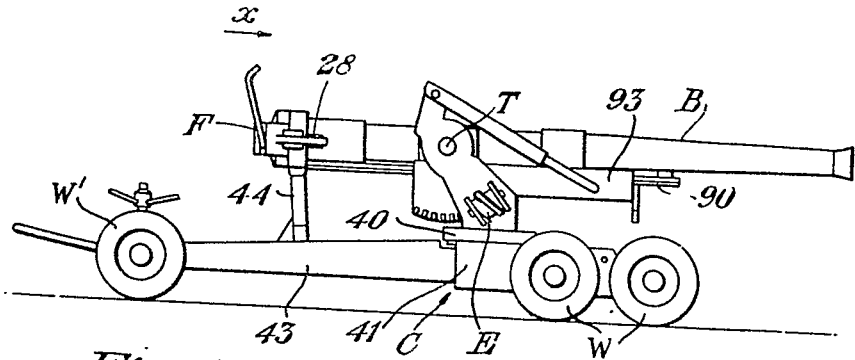


Fig. 1.

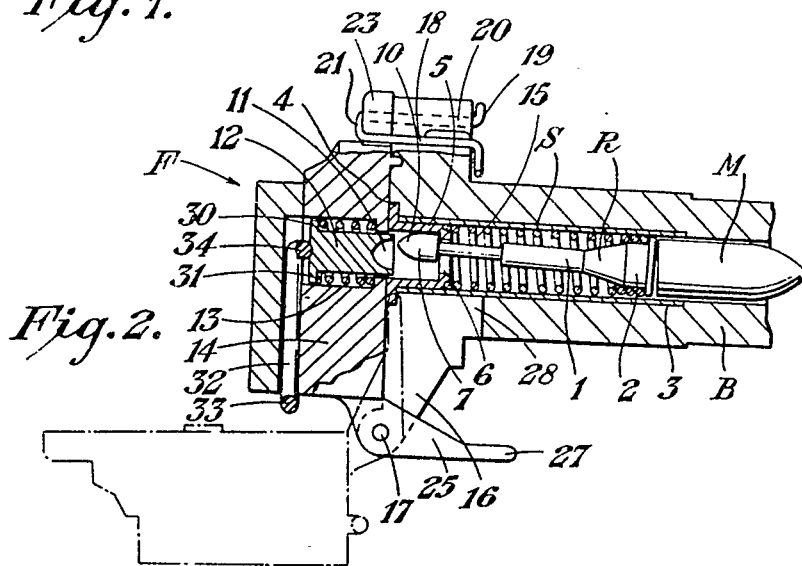


Fig. 2.

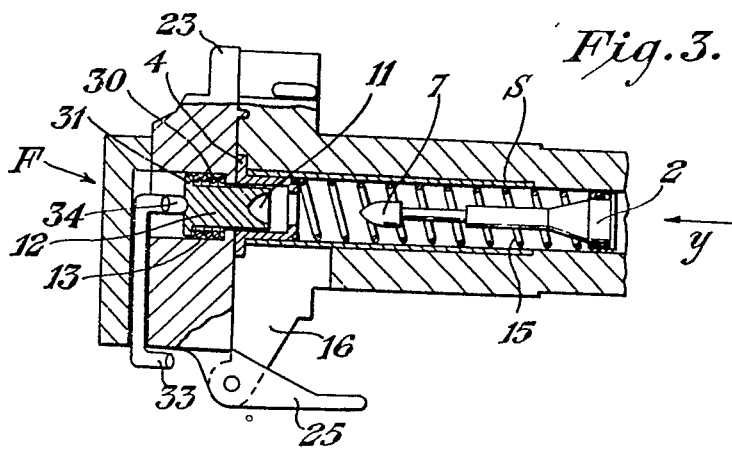


Fig. 3.

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This drawing is a reproduction of
the Original on a reduced scale.

SHEETS 1 & 2

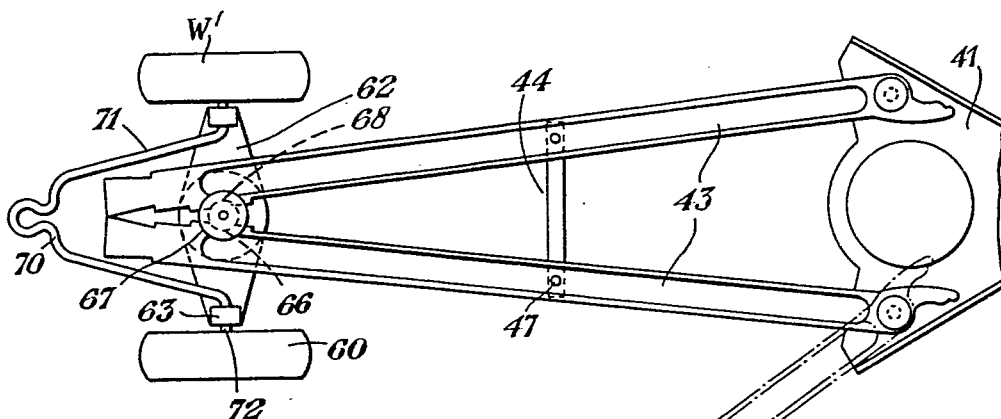
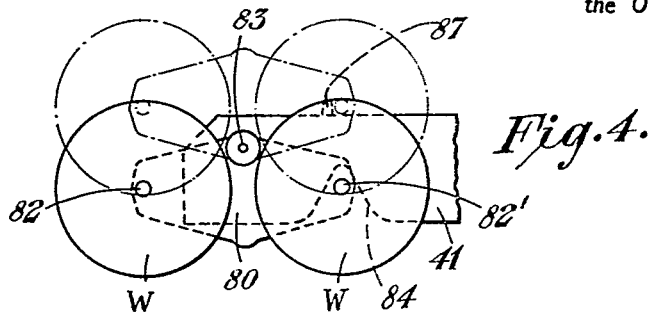


Fig. 5.

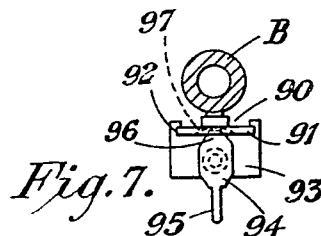
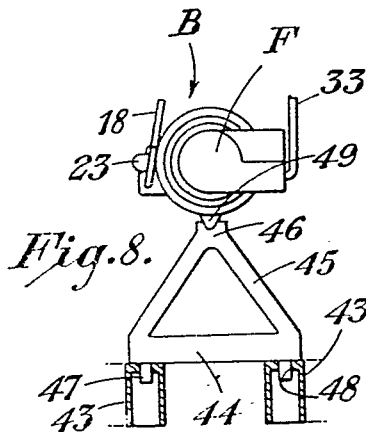
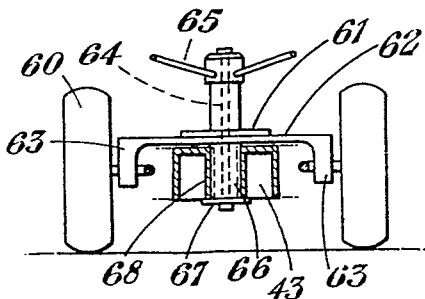


Fig. 6.



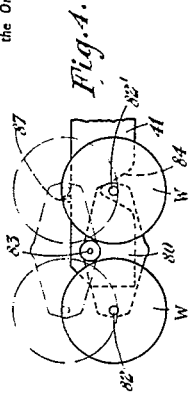


Fig. A.

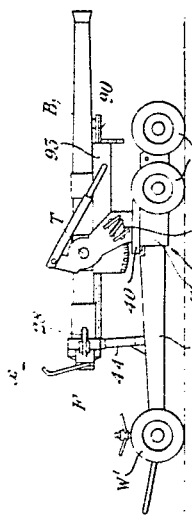


Fig. 1.

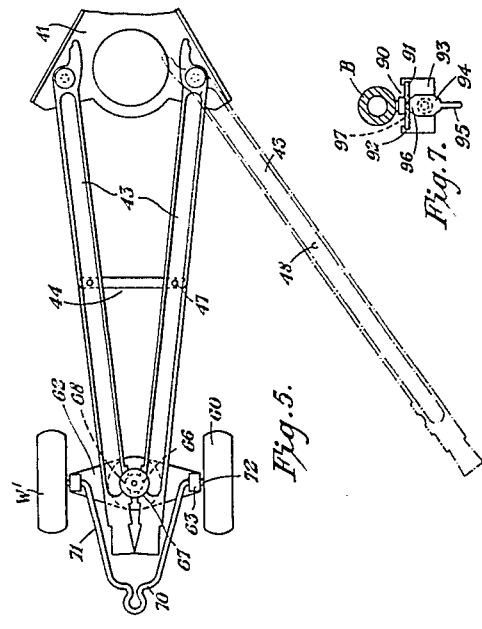


Fig. 5.

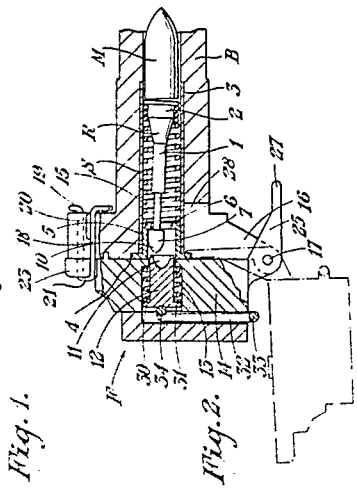


Fig. 2.

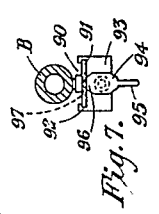


Fig. 7.

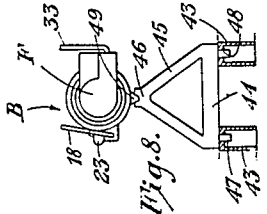


Fig. 8.

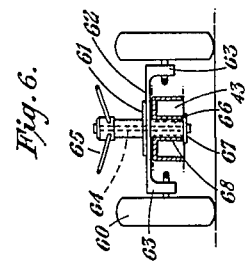


Fig. 6.

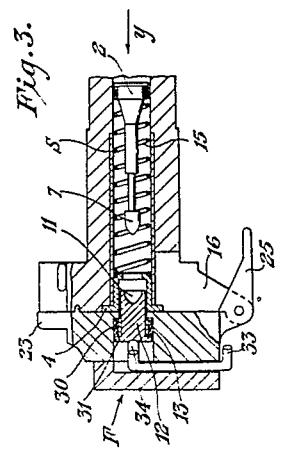


Fig. 3.