PATENT SPECIFICATION

Application Date: April 28, 1937. No. 12107/37. 494,527
Complete Specification Left: March 18, 1938.
Complete Specification Accepted: Oct. 27, 1938.

PROVISIONAL SPECIFICATION

Improvements in and relating to Photographic Hand Cameras

I, HARRY STEWARD, of "Erac", Thurston Avenue, Southchurch Boulevard, Southend-on-Sea, in the County of Essex, England, a British subject, do hereby declare the nature of this invention to be as follows:—

This invention relates to photographic hand cameras and has for its principal object to provide a construction which can be assembled by unskilled labour from units produced in bulk by methods of mass manufacture to constitute a conveniently operated contrivance having high camera efficiency at a low cost.

In a general way the invention refers to that type of hand camera in which the outer case is provided with a foresight and an extension in the form of a hand grip shaped somewhat similar to that of a pistol, a further object of the invention being the provision within the hand grip part of a magazine for film spools used and unused but not in use.

In particular the invention has reference to that kind of pistol camera in which the photographic shutter is operated by the trigger and the film is rewound by the trigger spring and has as an additional object to produce such a camera which shall be more compact and more robust than known cameras of this kind, shall be capable of an unusually large reserve of exposures, and which shall have double protection against leakage of light.

Cameras constructed according to this invention comprise a lens mount, a shutter assembly, a film container and operating means, a cover with film observation window, and an outer casing.

The lens mount usually is a die casting in the form of a flat plate having a hollow conical projection in which the lens is secured by cement or burnishing.

The shutter is of the automatic preset one speed type and the assembly consists of an apertured plate having thereon a spring stressed pivoted obturator element, and a spring stressed pivoted operating element, and a spring stressed two armed pivoted trip lever one end of which is engaged by a detent on the operating element when said element is moving in a specified direction and the other end of which engages with and deflects the obturator temporarily when said last named end is moving in a specified direction.

The operating element also has a limb which projects beyond the boundary of the plate and the parts cooperate so that when the limb is moved the detent on the operating element moves from its abutment and engages its end of the trip lever thus moving the trip lever from its abutment, the obturator actuating end of the trip lever cooperates with the obturator element and displaces said element from its abutment to uncover the aperture after which the detent and obturator actuator trip past the parts cooperating respectively therewith and the exposure is completed, the mechanism being reset automatically when the limb is released.

The film container consists of a die casting usually and comprises a base plate having a box projecting from the front side, said box at one end having a film exposing aperture and chambers for the spools of used and unused film, the other end of said box having an aperture on the optical axis and a flanged recess.

The flanged recess receives the shutter assembly which fits it closely and the recess is closed by the lens mount which is secured in place by screws or rivets and clamps the shutter assembly in place.

The lower part of the base plate is provided with a bearing in which a spindle is journalled, said spindle having the trigger secured at one end whilst the other end, which projects from the back of the base plate, has the film rewind actuating lever secured thereto.

A film rewind spindle is journalled in the end of one of the film chambers and has spool engaging means thereon, the other end of said spindle, which projects from the back of the base plate, being provided with a pinion.

A gear wheel is mounted freely on the back of the base plate and meshes with the pinion, said wheel being rotated in one direction only by a spring stressed pawl pivoted on an arm mounted freely on the pivot of the wheel.

The arm is provided with a slot receiving the end of the rewind actuating lever and with a projection, the path of travel of which passes across the projecting limb of the shutter assembly, so that when the trigger is drawn back, the rewind lever is moved thus passing the pawl around the gear wheel, which is held immovably by a spring click, and the limb of the shutter assembly effects exposure, and when the trigger is released a spring moves the actuating lever back to its initial position and rotates the gear wheel in so doing, thus rewinding the film for a fresh exposure.

The ends of the film chambers are closed by an element which may be die cast and has a projecting plate adapted to engage in grooves to form a cover excluding light from the film in use, said plate having a non actinic window for observing the film.

The outer casing may be formed in two or three parts, if formed in two parts they may be similar but handed, one of the parts receiving the film container (and associated units) which is secured in place by screws or other attaching means and the parts are so shaped that when a pair are assembled the mechanism is enclosed and a hand grip similar to that of a pistol is formed.

The hand grip is formed hollow to reduce weight and is provided with separators so that a number of spools, say four, can be inserted.

If the outer casing is formed in three parts the hand grip may be separate and used to secure the other two parts enclosing the mechanism in which case the hand grip has tunnels or passages in which spools can be carried.

Generally the parts of the outer casing can be moulded in plastic material such as a cellulose derivative, an artificial resin, a condensation product or the like or the parts can be formed from sheet metal or die cast metal as found most suitable.

To enable particular objects to be photographed a foresight is provided on the outer casing and snapshots are obtained by holding the camera at arms length, sighting the object and pressing the trigger.

It will be obvious that although for the purpose of description the use of die castings and sheet metal has been referred to, any other material or kind of material may be used and the parts may be formed in a way suitable to such material.

Dated this 28th day of April, 1937.

CHAS. J. R. BULLOUGH,
Chartered Patent Agent,
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Agent for the Applicant.

COMPLETE SPECIFICATION

Improvements in and relating to Photographic Hand Cameras

I, HARRY STEWARD, of "Erac", Thurston Avenue, Southchurch Boulevard, Southend-on-Sea, in the County of Essex, England, a British subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to hand cameras and has for its principal object to provide a construction which can be assembled by unskilled labour from units produced in bulk by methods of mass manufacture to constitute a conveniently operated contrivance having high camera efficiency at a low cost.

In a general way the invention refers to that type of hand camera in which the outer case is provided with a foresight and an extension in the form of a hand grip shaped somewhat similar to that of a pistol, a further object of the invention being the provision, within the hand grip part, of a magazine for film spools used and unused but not in use.

Pistol cameras are known in which the photographic shutter is operated when the trigger is pressed and the film is rewound by the return movement of the trigger or by parts associated with the trigger and the present invention has an additional object to produce such a camera which shall be more compact and more robust than known cameras of this kind, shall be capable of an unusually large reserve of exposures, and which shall have double protection against leakage of light.

The invention consists in a hand camera comprising a complete snapshot light tight camera structure using light sensitive film enclosed within a casing which is light tight except for a slot through which the camera operating lever projects as the trigger of an assembly simulating a fire arm.

In order that the nature of this inven-

tion may be the better understood a construction by way of example will now be described in relation to the accompanying drawings wherein similar letters of reference are applied to similar or analogous parts in the several figures of which:—

Figure 1 is an elevation in perspective of a camera, according to this invention, ready for use;

Figure 2 is an elevation in perspective of one half of the casing without the mechanism and showing the magazine;

Figure 3 is a cross section through the magazine;

Figure 4 is an enlarged fragmentary view showing the local engaging means between the halves of the casing;

Figure 5 is an enlarged fragmentary perspective view of the lens mount partly in section;

Figure 6 is a front elevation of a suitable shutter assembly;

Figure 7 is a perspective view of the body of the camera showing the plate for the operating means;

Figure 8 is a side elevation of the body of the camera with the lens mount in place;

Figure 9 is a side elevation of the plate for the operating means;

Figure 10 is a side elevation of a plate with modified operating gear;

Figure 11 is an end elevation of the cover for the film container showing the film observation window in cross section, and

Figure 12 is a fragmentary view showing a detail of the film rewind actuating lever.

Cameras constructed according to this invention comprise a lens mount *a*, a shutter assembly *b*, a camera body *c* including film containers *d* and operating means for the shutter and film, a cover *e* with film observation window *f*, and an outer casing in two parts *g* and *h*.

The lens mount *a* shown in the drawings is a die casting in the form of a flat plate a^1 having a hollow conical projection a^2 in which the lens a^3 is secured by a spring clamping ring a^4 although it may be held in place by cement or burnishing.

The lens mount *a* in addition to the lens a^3 carries a plate a^5 with an aperture a^6 adapted to act as a stop for the lens a^3, said plate a^5 being secured in place by a spring clamping ring a^7 or any equivalent means.

The shutter shown in the drawings is of the automatic preset one speed type and the assembly *b* consists of an apertured plate b^1 having thereon a spring stressed pivoted obturator element b^2, a spring stressed pivoted operating element b^3, and a spring stressed pivoted trip lever b^4 having two flexible arms, one flexible arm of which b^5 is bent down to form an angular tooth which is engaged by a detent b^6 on the operating element b^3 when said element is moving in the direction indicated by the arrow 1 whilst permitting of free movement of the element b^3 in the opposite direction, and the other flexible arm of which b^7 is bent down to form an angular tooth which engages with the arm b^8 of the obturator b^2 and deflects the obturator b^2 temporarily only when the arm b^7 is moving in the direction indicated by the arrow 2.

The operating element b^3 also has a limb b^9 which projects beyond the boundary of the plate b^1 and the parts cooperate so that when the limb b^9 is moved away from the abutment b^{10} the detent b^6 contacts with the angular tooth on the arm b^5 of the trip lever b^4 and moves the trip lever from the abutment b^{11} the angular tooth on the flexible arm b^7 of the trip lever b^4 passing over the arm b^8 of the obturator element b^2. Ultimately the detent b^6 in its travel passes beyond the angular tooth on the arm b^5 and the trip lever b^4 by its spring is returned to the initial position during which movement the angular tooth on the arm b^7 engages with the arm b^8 and displaces the obturator element from the abutment b^{12} to uncover the aperture b^{13} instantaneously; when the limb b^9 is released the detent b^6 passes under the angular tooth on the arm b^5 and the mechanism is reset automatically.

The mechanism of the assembly described above is simple and well suited for the purpose in hand but it forms no part of the invention and may be replaced by any assembly of suitable size, weight and type.

The camera body *c* shown in the drawing consists of a die casting and comprises a plate c^1 having a box c^2 projecting from the side c^3, said box c^2 at one end being open to form a film exposing aperture and having chambers *d*, *d* for the spools of used and unused film, the other end of said box having a wall c^4 with an aperture c^5 on the optical axis and a flanged recess c^6.

The flanged recess c^6 contains the shutter assembly *b* which fits it closely and is closed by the lens mount *a* which is secured in place by screws a^8 or rivets, and clamps the shutter assembly *b* in place.

The lower part of the plate c^1 is provided with a bearing c^7 in which a spindle c^8 is journalled, the spindle c^8

having the trigger c^9 secured at one end whilst the other end, which projects from the side c^{10} of the plate c^1, has the film rewind actuating lever c^{11} secured thereto.

A film rewind spindle d^1 is journalled in the end of the upper film chamber d and has spool engaging means d^2 thereon, the other end of the spindle d^1, which projects from the side c^{10} of the plate c^1, being provided with a pinion d^3.

A gear wheel k is mounted freely on the side c^{10} of the plate c^1 and meshes with the pinion d^3, said wheel k being rotated in one direction only by a pawl k^1 pivoted on an arm k^2 mounted freely on the pivot k^3 of the wheel k.

As shown in Figure 9 the pawl k^1 has a rearwardly extending part k^4 which is adapted to cooperate with the stop pin k^5 mounted in the plate c^1 and projecting from the side c^{10} when the lever c^{11} is rotated clockwise to define the limit of motion and as shown in Figure 10 the pawl k^1 is stressed in operative engagement with the teeth of the wheel k by the spring k^6 on the arm k^2.

The arm k^2 has a slot k^8 receiving the end c^{12} of the rewind actuating lever c^{11} (see Figure 12) and with a projection k^7 (see Figures 9 and 10), the path of travel of which passes across the limb b^9 of the shutter assembly b which projects through the slot c^{13} in the plate c^1, so that when the trigger c^9 is drawn back, the rewind lever c^{11} is moved thus passing the pawl k^1 round the gear wheel k, which may be held immovable by friction or by a spring click l^1, mounted on a cock piece l supporting the end of the spindle d^1 and the projection k^7 past the limb b^9 of the shutter assembly b to effect exposure, and when the trigger c^9 is drawn forwards it moves the actuating lever c^{11} back to its initial position and rotates the gear wheel d^3 in so doing, thus rewinding the film for a fresh exposure.

The film rewinding movement of the lever c^{11} can be effected by a spring c^{14} anchored at one end to the pin c^{15} and connected by the other end to the extension c^{16} of the lever c^{11} as shown in Figure 10 or by moving the trigger c^9 forwards with the fingers as indicated by the arrow in Figure 9.

The rewind of the film by finger operation of the trigger c^9 after exposure enables exposure to be effected by a lighter pull on the trigger c^9 than when the spring c^{14} is provided and a positive action can be obtained by shaping the part k^4 to be engaged by the projection c^{16} of the lever c^{11} to force the end of the pawl k^1 between the teeth of the gear wheel k during rewind.

The ends of the film chambers d d and the camera body c are closed by a cover e which as shown in the drawings is die cast and has a projecting plate e^1 adapted to slide in rebates d^4 by the side of the film chambers d d and enter the slot d^5 in the plate c^1 and a flange e^2 to form a cover excluding light from the film in use, said plate e^1 having a window f with a transparent non actinic disc f^1 secured in place by a spring clamping ring f^2 so that the film may be observed for initial setting.

To provide for the proper positioning of the film spools during use the end of the film chamber d, not having the means d^2 therein, and the inside of the cover e are provided with small conical projections d^6.

Certain classes of user experience some difficulty in handling the minature film spools used with such a camera as described above and to overcome this a guard clip m is provided, the end of the film chamber d being notched at d^7 to receive the gib m^1 on the projection m^2.

The outer casing as shown in the drawings is formed of thermo-plastic material in two parts g and h which are similar generally but complementary, the part g receiving the camera body c, the plate c^1 of which is secured in place by screws, hollow rivets or other attaching means which pass through the holes g^1 in the plate c^1 into the bosses g^2.

The part g for the majority of the margin is provided with a projecting flange g^3 which fits into the marginal recess h^3 of the part h with the exception of that part of the margin which is removed to form a slot g^5 for the trigger c^9. To ensure that the parts g and h snap together securely and in a light tight manner except at the slot g^5, ribs g^4 are arranged at x y and z on the flange g^3 and ribs h^4 are arranged similarly in the recess h^3.

The parts g and h are so shaped that when assembled all the mechanism is enclosed with the exception of the trigger c^9 and a hollow hand grip n similar to that of a pistol is formed. The hollow hand grip n internally is provided with separators in the form of pins n^1 arranged in pairs so that three spools o can be accommodated in the magazine as shown in Figures 2 and 3.

In some cases when for example the outer casing is formed from sheet metal the hand grip n may be separate and used to secure two parts enclosing the mechanism so that the outer casing in such construction is formed in three parts and when this is done the hand grip n may

have tunnels or passages in which the spare spools of film can be carried.

To enable particular objects to be photographed a foresight *p* is provided on the outer casing one half on each of the parts *g* and *h* and snapshots are obtained by holding the camera at arms length, sighting the object and pressing the trigger.

It will be obvious that although for the purpose of description the use of die castings and sheet metal and mouldings of thermo plastic material has been referred to, any other material or kind of material may be used and the parts may be formed in any way suitable to such material.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. An improved hand camera comprising a complete snapshot light tight camera structure using light sensitive film enclosed within a casing which is light tight except for a slot through which the camera operating lever projects as the trigger of an assembly simulating a fire arm.

2. In an improved hand camera as claimed in claim 1, the arrangement of shutter mechanism operated by pulling the trigger, and film feeding mechanism operated when the trigger is moved in opposite direction.

3. In an improved hand camera as claimed in claim 2, the arrangement of a spring stressed by the trigger when pulled to effect exposure and operating to feed the film automatically when the trigger is released.

4. An improved hand camera as claimed in any of the preceding claims, characterised in that the handle portion is formed hollow to serve as a magazine for spools of film.

5. An improved hand camera as claimed in any of the preceding claims, characterised in that the light tight casing is composed of two substantially similar but complementary parts adapted to fit the one into the other and to be secured together by locally arranged cooperating ribs.

6. An improved hand camera as claimed in claim 5, characterised in that the snapshot camera structure has a plate carrying the trigger mechanism, said plate being secured permanently to one of the parts of the light tight casing.

7. An improved hand camera simulating a fire arm comprising a camera body, an apertured front to said body, a flanged recess on said front, a complete automatic preset one speed shutter assembly in said recess, a lens and mount for covering said recess and retaining said shutter assembly in said recess, a plate on said body, gearing on said plate for film feeding, a trigger, mechanism for transmitting motion to said gearing from said trigger in one direction of rotation only, mechanism for transmitting motion to said shutter from said trigger when pulled, film spool chambers on said body, a light tight cover for said body and said chambers, a casing in two parts for enclosing said body, a hand grip for said casing, a film spool magazine in said hand grip, means for connecting the two parts of the casing together securely and a foresight on said casing to enable the optical axis of the camera to be directed on the object to be photographed.

8. An improved hand camera as claimed in claims 1 to 5 or any of them, characterised in that the light tight casing is formed in two parts secured together by a separate hand grip constituting a magazine for film spools.

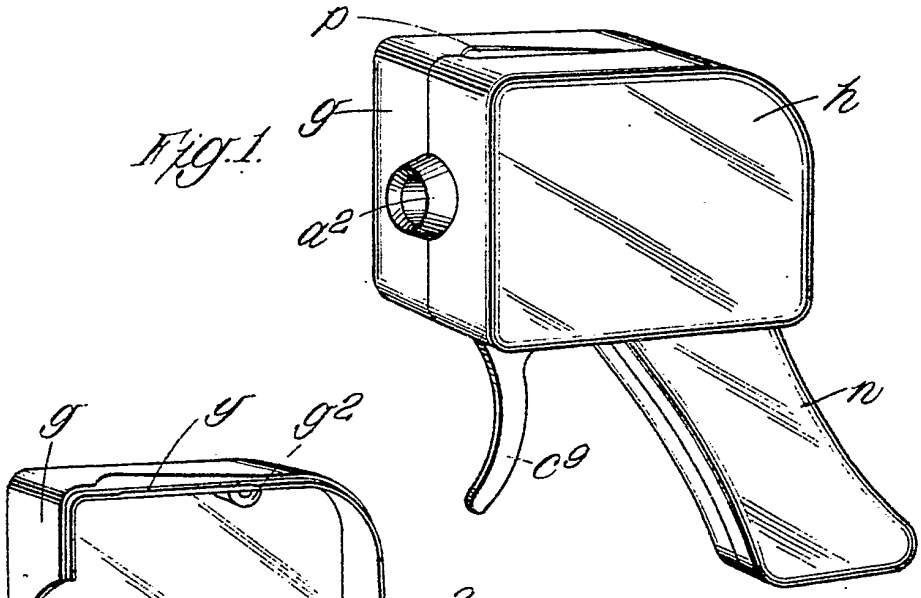
9. An improved hand camera constructed and arranged substantially as described and shown in the accompanying drawings.

Dated this 18th day of March, 1938.

CHAS. J. R. BULLOUGH
Chartered Patent Agent,
29, Southampton Buildings,
London, W.C.2,
Agent for the Applicant.

Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press.—1938.

Fig. 1.



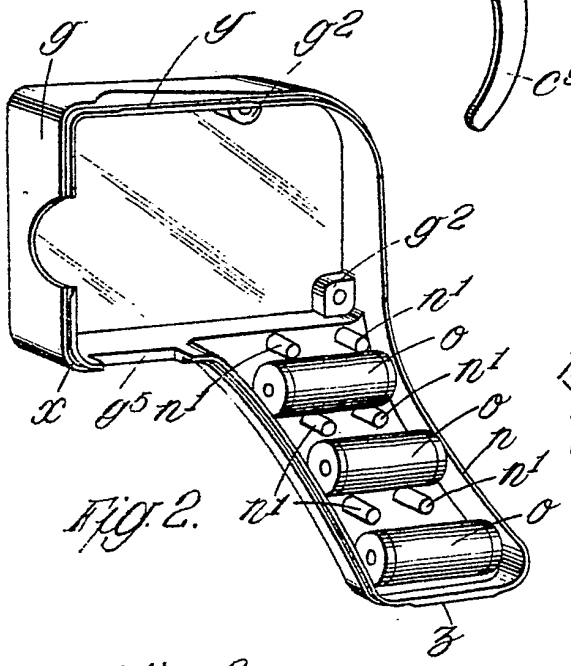
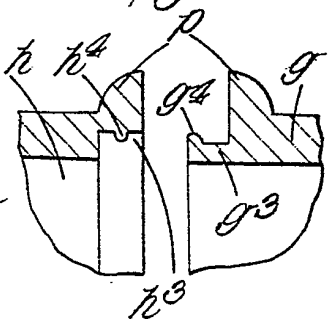


Fig. 2.

Fig. 4.



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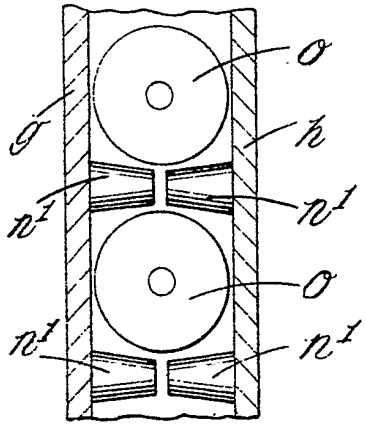
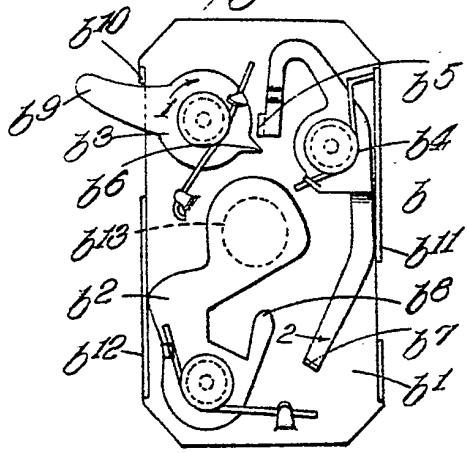


Fig. 6.



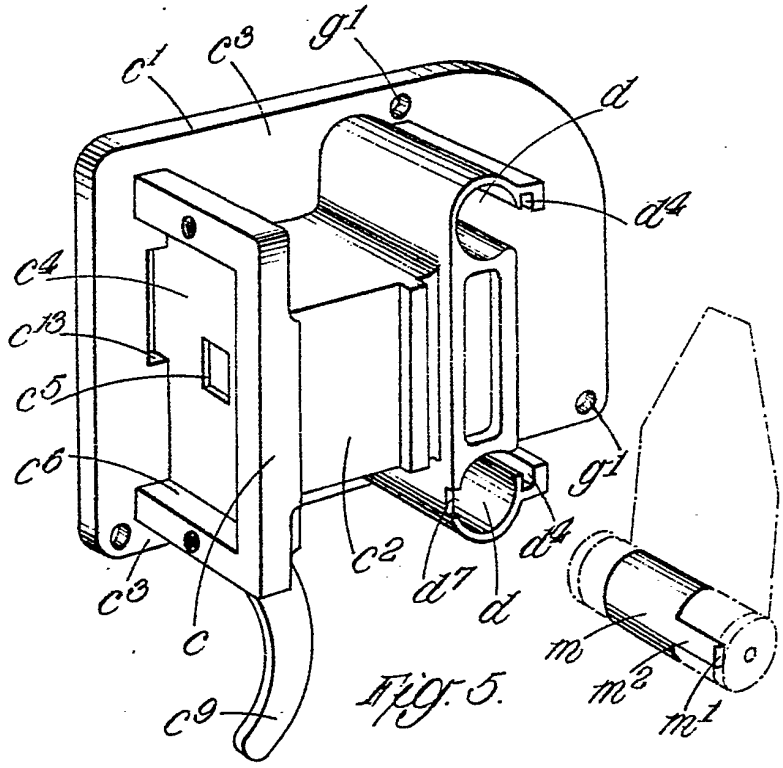


Fig. 5.

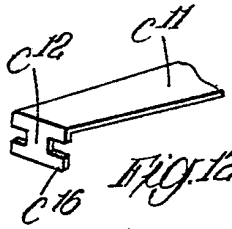


Fig. 12.

Fig. 7.

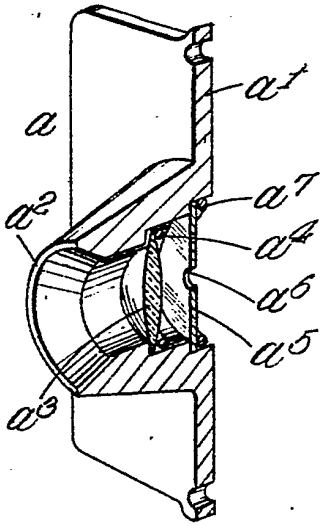
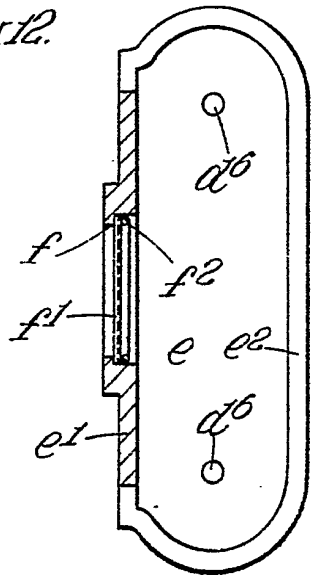


Fig. 11.



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494,527 COMPLETE SPECIFICATION

3 SHEETS

SHEET 1

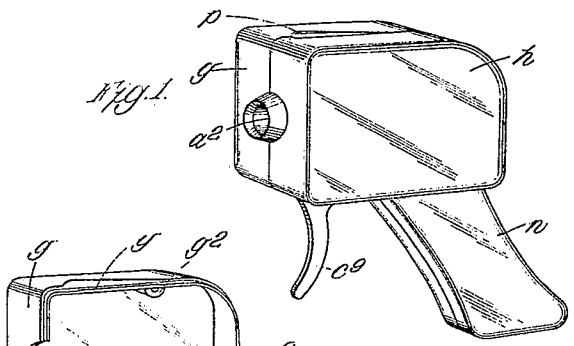


Fig. 1.

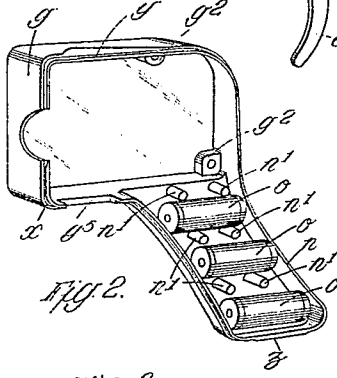
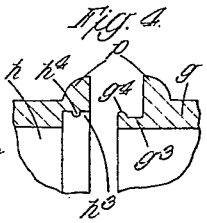


Fig. 2.



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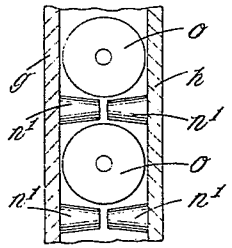


Fig. 3.

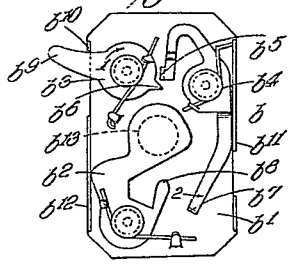


Fig. 6.

SHEET 2

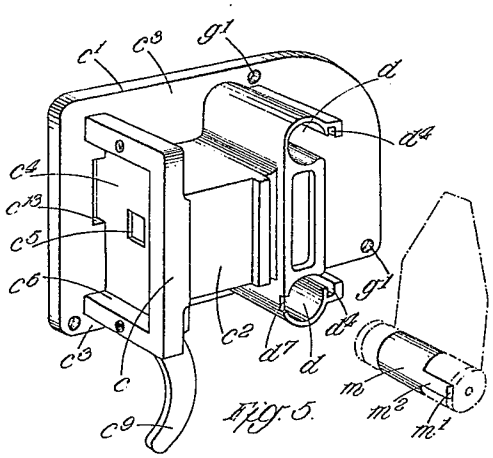
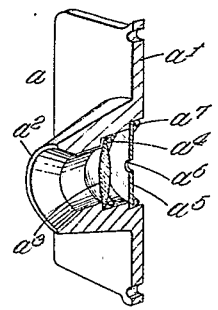


Fig. 5.



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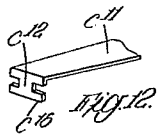

Fig. 12.

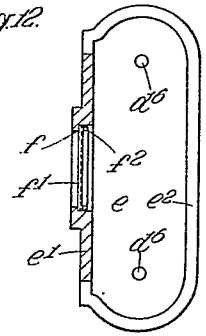

Fig. 11.

[This Drawing is a reproduction of the Original on a reduced scale.]

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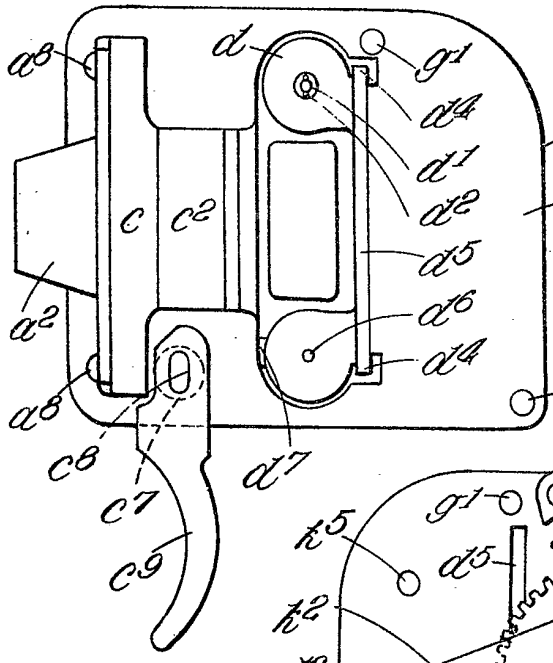

Fig. 8.

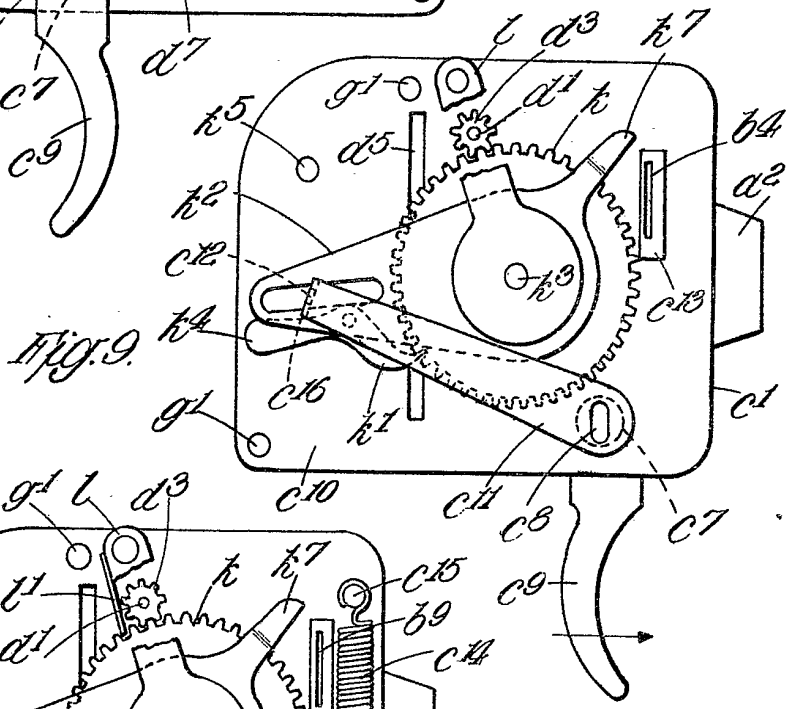

Fig. 9.

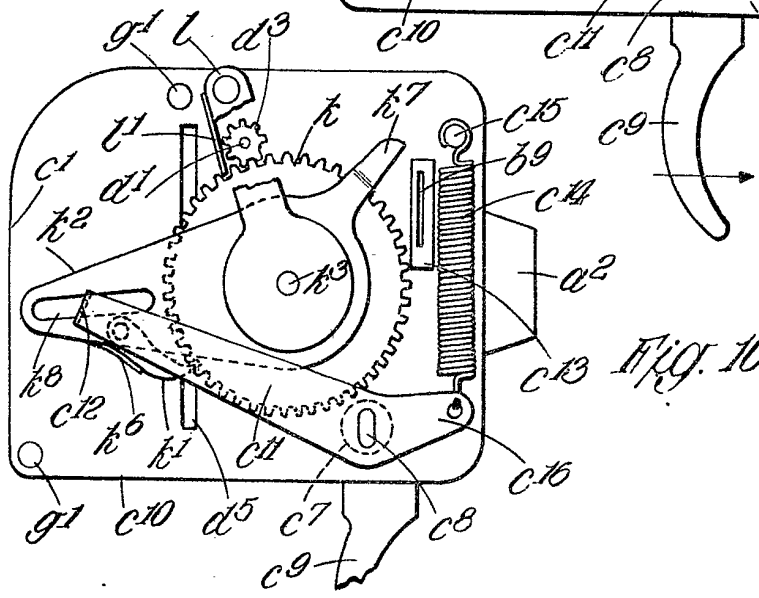

Fig. 10.

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