

Dec. 7, 1937.

C. J. MANVILLE

2,101,148

MACHINE PROJECTOR

Filed March 11, 1935

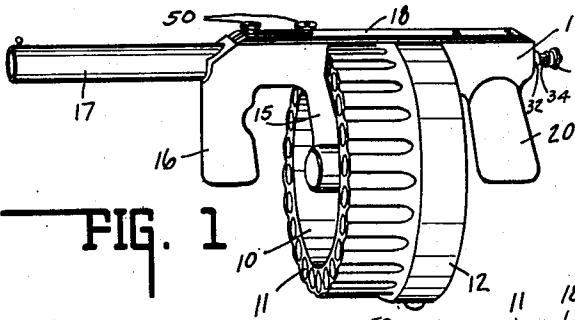


FIG. 1

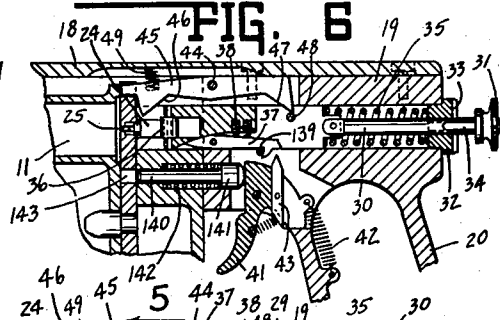


FIG. 6

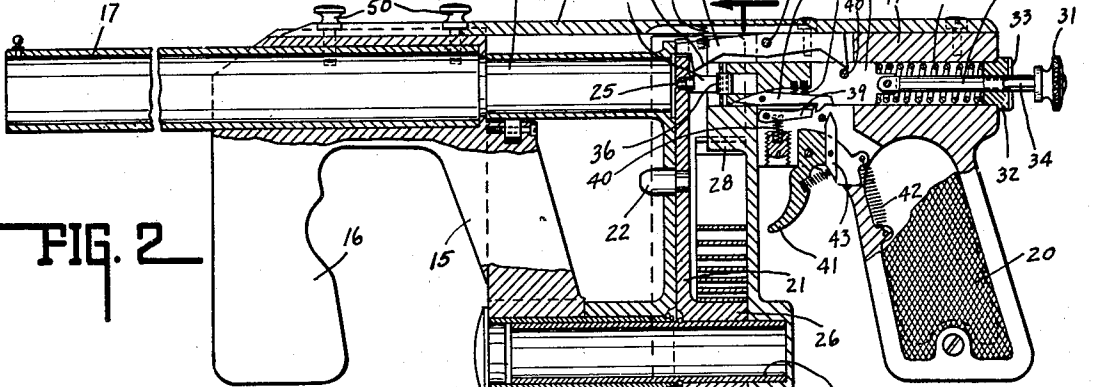


FIG. 2

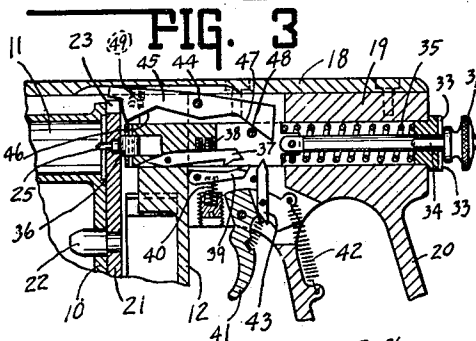


FIG. 3

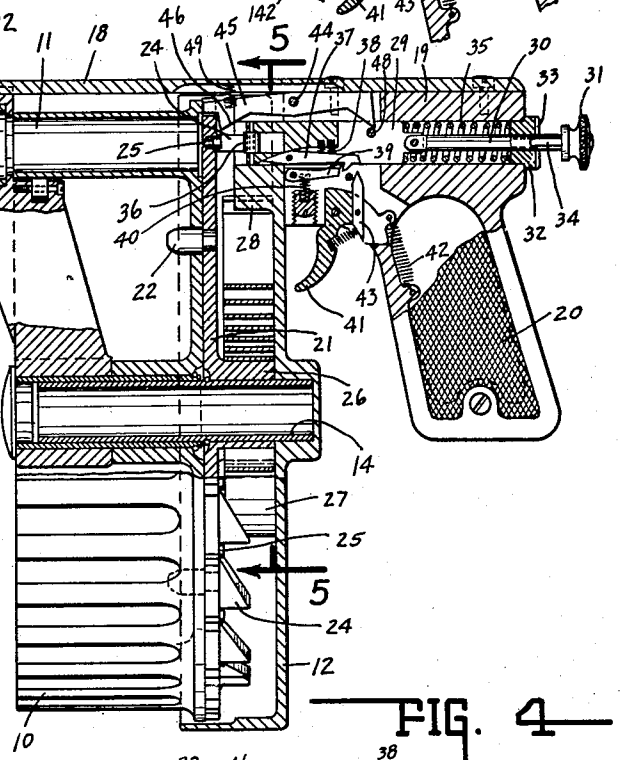


FIG. 4

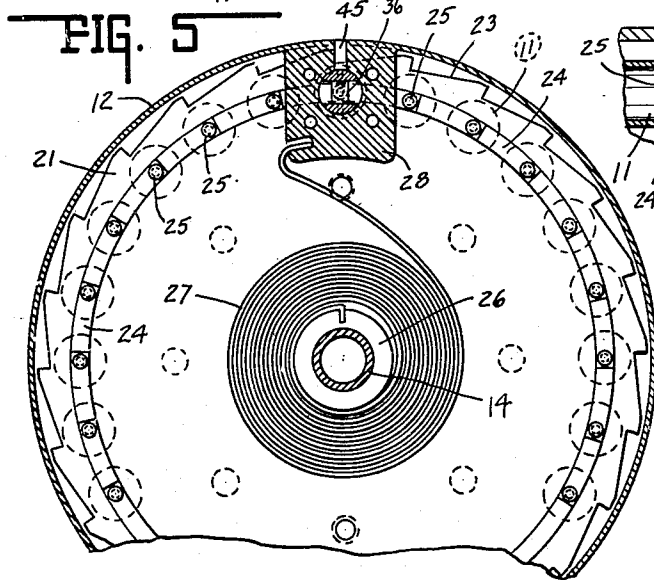
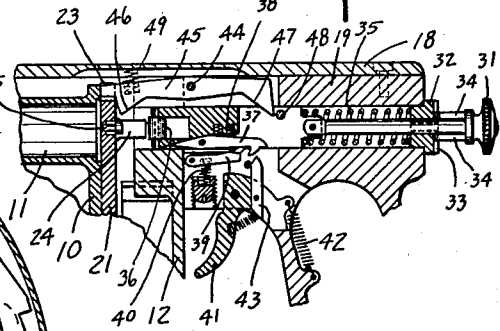


FIG. 5



INVENTOR.

CHARLES J. MANVILLE.

BY *Lockwood, Goldsmith & Galt*

ATTORNEYS.

UNITED STATES PATENT OFFICE

2,101,148

MACHINE PROJECTOR

Charles J. Manville, Indianapolis, Ind.

Application March 11, 1935, Serial No. 10,347

13 Claims. (Cl. 42—5)

This invention relates to a machine projector adapted principally for the projection or firing of tear gas shells, although applicable to firing other types of shells, such as shells embodying shot, slugs and the like.

It is the purpose of the invention to provide a projector which will discharge a plurality of shells containing gas, shot or slugs in rapid succession, and is principally adapted for use in handling mobs, strikes, jail deliveries and other similar unlawful gatherings involving violence and destruction.

Briefly, the invention consists in providing a circular rotatable magazine containing up to twenty-four or more shells which, through the means of cams and springs, is caused to rotate to automatically and successively bring the shell chambers into firing position upon each firing operation.

One feature of the invention resides in the provision of an individual firing pin for each chamber or shell, as distinguished from the usual structures embodying only a single firing pin for all chambers or shells. By reason of this arrangement, in event a pin jams or breaks, or a shell fails to fire, all other shells will continue to be fired by their respective operative pins, since the automatic recocking and firing mechanism will be unaffected thereby. This is to overcome the danger of rendering the entire firing operation ineffective at a crucial moment by damage to the pin. Thus, by reason of this invention, in a projector having twenty-four chambers and twenty-four pins, should one pin or shell become ineffective, there would still be twenty-three shells fired. On the other hand, a projector employing a single pin or recoil for recocking and rejection of a shell would become ineffective as to all the twenty-four shells, none of which would fire.

Other features of the invention reside in the arrangement of the cocking cam and the chamber registering cam which makes the projector automatic and positive in its action. Thus, the operation of the trigger to fire a cartridge automatically and rapidly recocks the firing pin plunger upon completion of its firing operation, preparatory to the next firing operation. The register cam is also operated thereby to lock the rotatable magazine in position with a chamber in registry with the muzzle at the instant of firing, and releasing the chamber to permit partial rotation to register the next chamber with the muzzle immediately upon completion of the firing operation. Thus the projector is automatic in its

operation and operates as positively and rapidly as the trigger is pulled.

Still a further feature of the invention resides in the locking device to prevent manual rotation or winding of the magazine until the firing mechanism is on safety, thus eliminating any danger of premature or accidental firing during the setting of the magazine.

In addition to the above, the trigger and hammer are so associated as to permit the firing of only one shell for each trigger operation. This permits accurate and positive determination and control of the firing operation.

The above and other features of the invention will be set forth in the specification and claims.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims:

Fig. 1 is a perspective view of the machine projector. Fig. 2 is a central vertical section thereof showing portions in elevation and with the firing hammer cocked for firing. Fig. 3 is a section through the firing mechanism showing it in firing position. Fig. 4 is the same as Fig. 3 showing the firing mechanism in safety position. Fig. 5 is a section taken on the line 5—5 of Fig. 2 showing the magazine in its cocked or initial firing position. Fig. 6 is the same as Figs. 3 and 4 showing a modified form.

In the drawing there is illustrated a machine projector comprising a drum-like magazine 10 containing a plurality of shell chambers 11 spaced about the periphery thereof. Removably associated with the magazine on one side thereof there is a cam housing or drum 12. The magazine is rotatably supported upon a centrally disposed stud 14 mounted upon a bracket 15 which carries a forward handle 16 and a muzzle 17. Removably associated therewith, in addition to the drum, there is a cover plate 18 integral with the drum and a housing 19 containing the fire mechanism. Depending from the housing 19 there is a pistol handle 20.

The magazine 10 is rotatably mounted upon the stud 14 which is in the form of a tubular sleeve, so as to bring each of the chambers 11 into registry with the muzzle 17 as it is rotated. Anchored with the magazine and rotatable therewith there is a cam disc 21 having a plurality of inwardly projecting pins 22 adapted to extend through suitable openings or perforations in the rear face of the magazine. Said cam disc is provided with a plurality of peripherally formed ratchet teeth 23 which act as registering cams, one for each chamber 11. On the rear face of the

disc there are provided a plurality of tooth-like cam members 24 extending laterally from the surface and housed by the drum 12. The cam members 24 are slightly spaced apart to permit a firing pin 25 to be positioned therebetween, there being provided one firing pin for each chamber 11. Said cam disc is provided with a hub 26 rotatably mounted upon the stud 14 in which there is anchored one end of a winding spring 27. The other end of said spring is anchored to a block 28 secured to the drum 12.

The control mechanism comprises principally a firing hammer 29 which is in the form of a cylindrical plunger slidably mounted in the housing 19. The rear end of said plunger is connected to a rod 30 terminating in the safety device head 31. The rod 30 is slidable in a closure plug 32 which is provided with a diametrically positioned groove 33 in which the ends of the pins 34 are adapted to engage when the mechanism is on safety. In firing position, the head 31 is turned so that the pins 34 are diametrically opposed to the grooves 33 and the slots in the plug 32 permit the pins 34 to slide therethrough when the head 31 is turned from the safety position illustrated in Fig. 4 to the firing position illustrated in Figs. 2 and 3. Surrounding the rod 30 there is a firing spring 35 which is compressed under spring tension in the safety or cocked position shown in Figs. 2 and 4. Thus, upon the hammer 29 being released, the spring 35 forces it forwardly under spring tension to a position where a head 36 in the form of a roller strikes the firing pin 25 and causes it to fire a shell in the chamber 11 in the usual manner, the firing position thereof being illustrated in Fig. 3.

To release the hammer 29 there is pivotally mounted therein a spring pressed latch 37 normally held in latched position by springs 38 against a latching finger 39, said finger being pivoted to the housing 19 and pressed into engagement with the latch under tension of a spring 40. A finger trigger 41 is pivoted to the housing and normally held in forward position by a spring 42. Said trigger carries a plunger 43 pivoted thereon in position to engage the end of the latch 37 when latched through operation of the trigger to release said latch against the tension of the spring 38 from the finger 39. Upon release of said latch, the spring 35 becomes effective to operate the hammer 29 for firing a shell.

For periodically registering a new chamber 11 with the muzzle 17 after each successive shot, there is fulcrumed within the housing 19 at 44 a locking arm 45 having its lower edge provided with oppositely disposed cam surfaces 46 and 47. The surface 47 is in the path of a pin 48 on the hammer 29, while the cam surface 46 is in the path of the end of the hammer. Adjacent the cam 46 there is a projection which extends into the path of movement of the registering cams or ratchet teeth as illustrated in Fig. 5. The cam is normally maintained in locking position with respect to the registering cams by a spring 49.

When the hammer is retracted, as shown in Figs. 2 and 4, the pin 48 engages the cam surface 47 and, coupled with the pressure exerted by the spring 49, maintains the projection in engagement with the face of one of the registering cams to hold its corresponding chamber 11 in registry with the muzzle. Said chamber is thus held locked in registering position until the hammer operates the firing pin as shown in Fig. 3. Such forward movement of the hammer engages the

cam surface 46 while the pin 48 on the hammer releases the cam surface 47, thus forcing the forward end of the lever 45 upwardly so that the projection is lifted out of engagement with the registered cam to permit rotation of the magazine immediately upon firing to bring the next succeeding chamber into firing position.

In operation, it may first be noted that the projector comprises two removable sections, one section including the magazine muzzle, bracket 15 and handle 16, while the other section includes the cam disc, spring housing 12, firing mechanism housing 19, handle 20 and plate 18. Said parts are removably connected in operation by the thumb screws 50. To load the magazine, the thumb screws 50 are loosened and the two sections are slipped apart, the pins 22 disengaging the openings in the rear face of the magazine, whereupon the shells may be inserted in the usual manner within their respective chambers 11 from the rear. Upon the magazine being thus loaded, the sections are again connected as illustrated in Fig. 2 and the screws 50 tightened in place.

The projector is normally on safety as illustrated in Fig. 4, wherein the hammer is retracted with the spring 35 compressed and the pins 34 engaging the groove 33 in the plug 32. To fire the projector, the head 31 is rotated a quarter revolution to free the pins 34 from the grooves 33 to allow them to register with the slots or openings provided therefor in the plug 32.

The projector is fired by pulling the trigger 41 which releases the latch 37 permitting the hammer to be forced forwardly by the spring 35. The head 36 of the hammer is caused to impact upon the firing pin 25 which will fire the shell in the usual manner. Simultaneously therewith, the forward end of the hammer will engage the cam surface 46 of the lever 45 to throw the projecting end thereof upwardly against the tension of the spring 49 to disengage the registry cam 23. This allows the spring 37 to take effect to rotate the cam disc 21 as illustrated in Fig. 5 in the clockwise direction. Such movement of the cam disc causes one of the cocking cams 25 to engage the roller 36 of the hammer and force it rearwardly to cocking position thereby permitting the latch 37 to engage the latch finger 39 by reason of the tension of the springs 38. Thus the hammer is again cocked under tension of the spring 35.

Upon the cocking action of the hammer, the cam surface 46 of the lever 45 is released to permit the spring 49 to cause the projecting end to follow down the inclined surface of the next following registry cam 23. The pin 48 is at the same time brought into engagement with the cam surface 47 of said lever to more positively force its projecting end downwardly so as to arrest further clockwise movement of the cam disc when the face of the next following cam 23 engages thereagainst. In this position, the next succeeding chamber 11 is brought into registry with the muzzle. Thereupon the projector is ready for the next firing operation. Thus, it will be noted that the firing action of the hammer simultaneously fires and releases the registry cam while the spring 27 immediately and automatically partially rotates the magazine to bring the next chamber into position, which rotation recocks the hammer.

If one of the firing pins becomes broken or obstructed or the corresponding shell fails to fire, the automatic magazine action and recocking will be unaffected so that the following shell will be

fired by its individual firing pin irrespective of the ineffectiveness of the preceding one.

After all the chambers have been emptied, the spring 27 will have been unwound, whereupon the sections of the projector are separated, the magazine reloaded and the spring wound by manually rotating the magazine in counterclockwise direction.

In order to prevent manual rotation of the magazine for winding the spring 27, when the firing mechanism is in firing position, the pin 48 is so positioned on the hammer 29 as to remain in engagement with the cam surface 47 to hold the projection 33 in locking engagement with the registry cams 23. Upon the firing mechanism being moved to safety position, as illustrated in Fig. 4, wherein the pins 34 engage in the grooves 33, the pin 48 is moved rearwardly and free of the cam surface 47, as illustrated in Fig. 4, so as to release the lever 45 and permit it to ratchet over the registry cams 23 and to wind the spring.

In the modified form illustrated in Fig. 6, the finger 39 is eliminated and in place thereof there is provided a pin 139 for latching engagement by the trigger latch 37. In addition thereto, there is provided a plunger 140 having a head 141 and pressed by the spring 142 to normally retain it in retracted position with the head bearing against the trigger. The cam disc is provided with a plurality of perforations 143 spaced thereabout so that there will be one perforation for each firing chamber. This arrangement is particularly adapted for use in firing a shotgun shell where it is desirable that there be no movement of the magazine until after completion of the discharge through the muzzle. Thus, upon pulling the trigger, the plunger 140 is forced into one of the perforations 143 which locks the magazine against movement until the trigger is released.

The invention claimed is:

1. A projector for firing cartridges including a muzzle, an annular drum-like magazine rotatably mounted with respect to said muzzle and having a plurality of cartridge chambers extending thereabout, a spring for rotating said magazine to bring an unfired chamber into firing position with respect to said muzzle upon firing of the preceding chamber, a plurality of ratchet teeth for arresting the movement of said magazine in its successive firing positions, a trigger-actuated hammer operating in alignment with said muzzle and registering magazine, a plurality of actuating cams on said chamber for cocking the hammer upon movement of the magazine, and means for locking the magazine in firing position and releasing it for movement to the succeeding firing position by movement of the hammer.

2. A projector for firing cartridges including a movable magazine having a plurality of cartridge chambers, means for automatically moving said magazine to bring successive chambers into firing position, a hammer for firing the cartridge, a plurality of cams mounted on said magazine, one of said cams being associated with each chamber, and a roller mounted on the end of the hammer adapted to be engaged by one of said cams for moving the hammer to cocked position upon the magazine being moved to bring a new chamber into firing position.

3. A projector for firing cartridges, including a rotating magazine having a plurality of cartridge chambers, a spring for automatically rotating said magazine a partial revolution to bring a new chamber into firing position upon

firing of the preceding chamber, a sliding hammer for firing a cartridge, a finger trigger for releasing said hammer, a spring for actuating said hammer upon release thereof and means on said magazine actuated by the succeeding movement thereof for engaging said hammer and returning it to cocked position.

4. A projector for firing cartridges including a movable magazine having a plurality of cartridge chambers, means for firing a cartridge within a chamber when moved to firing position, a ratchet toothed cam associated with each of said chambers, and a pivoted lever normally maintained in engagement with one of the toothed cams for registering the magazine in the firing position, said lever being in position to be struck by the firing means for disengagement of said cam upon movement of the firing means to firing position.

5. A projector for firing cartridges including a rotating magazine having a plurality of cartridge chambers, a spring for rotating said magazine in one direction, a plurality of ratchet toothed cams extending about said magazine, one cam for each chamber, a registering member positioned to be engaged by each of said cams for preventing rotation by said spring in one direction and registering the magazine in firing position, and a sliding hammer for firing a cartridge within the chamber when registered in firing position adapted to engage said member upon the cam while permitting it to reengage the next succeeding cam to again register the magazine with the next succeeding chamber in firing position.

6. A projector for firing cartridge shells including a rotatable magazine having a plurality of cartridge chambers, a helical spring for exerting tension on said magazine for rotating it to bring successive chambers into firing position, firing mechanism, means for locking said firing mechanism against operation, a plurality of ratchet teeth on said magazine, a pivoted lever for engaging said teeth to lock the magazine in firing position under tension of said spring while permitting rotation of the magazine in the opposite direction for manually winding said spring, and a sliding hammer having a projection thereon for engagement with said lever to prevent its disengagement from a ratchet tooth when the hammer is in operative position for preventing manual movement of said magazine, said pin being moved out of engagement with said lever to permit manual operation of the magazine when said hammer is retracted to safety position.

7. A projector for firing cartridges including a muzzle, a rotatable magazine having a plurality of cartridge chambers spaced thereabout, means for automatically rotating said magazine to bring said chambers successively into registry with said muzzle, a hammer for firing the cartridge in the registered chamber, a finger trigger for actuating said hammer, ratchet teeth on said magazine corresponding to said chambers respectively, a lever acting as a pawl for engaging said teeth controlled by the movement of said hammer, a finger trigger for actuating said hammer whereby said pawl and teeth will lock said magazine and hammer against more than one movement for each trigger operation, and a spring pressed plunger actuated by said trigger for engaging the magazine and further locking it against movement while the trigger is retracted to firing position.

8. A projector for firing cartridges including a muzzle, an annular rotatable magazine rotatably mounted with respect to said muzzle and having

a plurality of cartridge chambers spaced thereabout, means for pivotally supporting said magazine with respect to said muzzle whereby said chambers may be brought successively into registry therewith upon rotation thereof, a handle forward of said magazine for supporting the same, a cam disc connected with said magazine to rotate therewith, a spring for rotating said magazine in one direction under spring tension, individual firing pins associated with each chamber for firing the cartridge contained therein when brought to firing position, firing mechanism for operating said firing pins when in firing position, ratchet toothed registry cams extending about said disc, a pawl lever controlled by said firing mechanism for engagement with said registry cams to maintain said chambers in registry with the muzzle upon firing while permitting successive chambers to be moved by said spring into registry, and a plurality of cocking cams positioned about said cam disc corresponding with said chambers respectively positioned to recock said firing mechanism after each firing operation by the rotary movement of the magazine in bringing the next succeeding chamber into firing position.

9. A projector for firing cartridges including a muzzle, an annular rotatable magazine rotatably mounted with respect to said muzzle and having a plurality of cartridge chambers spaced thereabout, means for pivotally supporting said magazine with respect to said muzzle whereby said chambers may be brought successively into registry therewith upon rotation thereof, a handle forward of said magazine for supporting the same, a cam disc connected with said magazine to rotate therewith, a spring for rotating said magazine in one direction under spring tension, individual firing pins associated with each chamber for firing the cartridge contained therein when brought to firing position, firing mechanism for operating said firing pins when in firing position, ratchet toothed registry cams extending about said disc, a pawl lever controlled by said firing mechanism for engagement with said registry cams to maintain said chambers in registry with the muzzle upon firing while permitting successive chambers to be moved by said spring into registry, a plurality of cocking cams positioned about said cam disc corresponding with said chambers respectively positioned to recock said firing mechanism after each firing operation by the rotary movement of the magazine in bringing the next succeeding chamber into firing position, means for locking said firing mechanism in non-firing or safety position, and means for preventing manual rotation of said magazine when said firing mechanism is off of safety position.

10. A projector for firing cartridges including a movable magazine having a plurality of cartridge chambers, a spring for moving said magazine, mechanism for firing a cartridge within a chamber when brought to firing position by the action of said spring, a plurality of cam teeth extending from said magazine, each chamber having a tooth associated and movable there-

with, a pivoted latch normally engaging said teeth respectively to arrest the movement of the magazine when brought to firing position, and means actuated by the firing mechanism during its movement to firing position for temporarily moving said latch from tooth engagement to permit movement of the magazine to the next firing position substantially simultaneously with the firing operation.

11. A projector for firing cartridges including a rotating magazine having a plurality of cartridge chambers adapted to be brought in registry with the magazine of the projector, a spring for rotating said magazine to bring successive chambers into registry, a plurality of ratchet teeth extending about the magazine, a pawl engaged by said ratchet teeth respectively for retaining one of said chambers in registering position, a hammer for firing a cartridge contained in one of said chambers, means for causing disengagement of the engaged tooth by said pawl upon the hammer moving to cartridge striking position to permit partial rotation of the magazine, and means for causing said pawl to engage the next succeeding tooth upon retraction of the hammer for registering the next succeeding chamber with the muzzle.

12. A projector for firing cartridges including a rotatable magazine having a plurality of cartridge chambers, a spring for rotating said magazine, means for limiting the rotation of said magazine to a partial revolution for bringing successive chambers into registry with the muzzle of the projector, a hammer for firing a cartridge contained in the registered chamber, and a cam on said magazine associated with each of said chambers for engaging said hammer and retracting it upon partial rotation of said magazine to permit a succeeding firing operation.

13. A projector for firing cartridges including a muzzle, an annular rotatable magazine mounted with respect to said muzzle and having a plurality of cartridge chambers spaced thereabout, means for pivotally supporting said magazine with respect to said muzzle whereby said chambers may be brought successively into registry therewith upon rotation thereof, a spring for rotating said magazine in one direction under spring tension, a pin for firing a cartridge contained in each of said chambers when the latter are brought into registry with said muzzle, firing mechanism for operating said firing pin, ratchet teeth extending about said magazine, a pawl controlled by said firing mechanism for engagement with said teeth to position the respective chambers in registry with the muzzle while permitting successive chambers to be moved by said spring into registry, and a plurality of cocking cams positioned about said magazine corresponding with said chambers respectively so positioned as to recock said firing mechanism by the spring actuated movement of the magazine in bringing the next succeeding chamber into firing position.

CHARLES J. MANVILLE. 65