

July 4, 1967

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3,329,063

ROCKET MACHINE GUN

Filed April 14, 1965

3 Sheets--Sheet 1

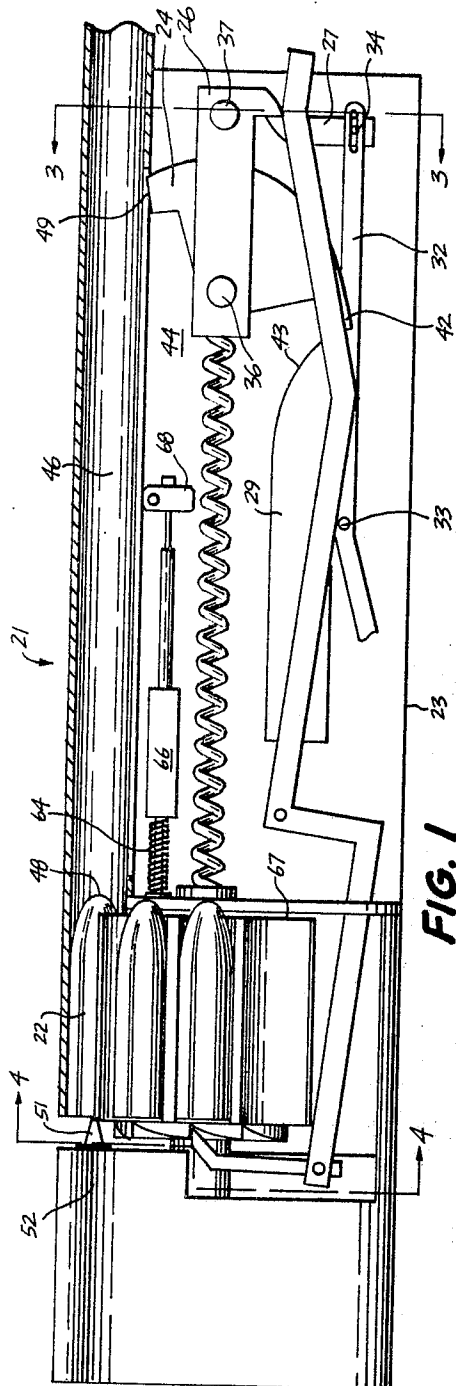


FIG. 1

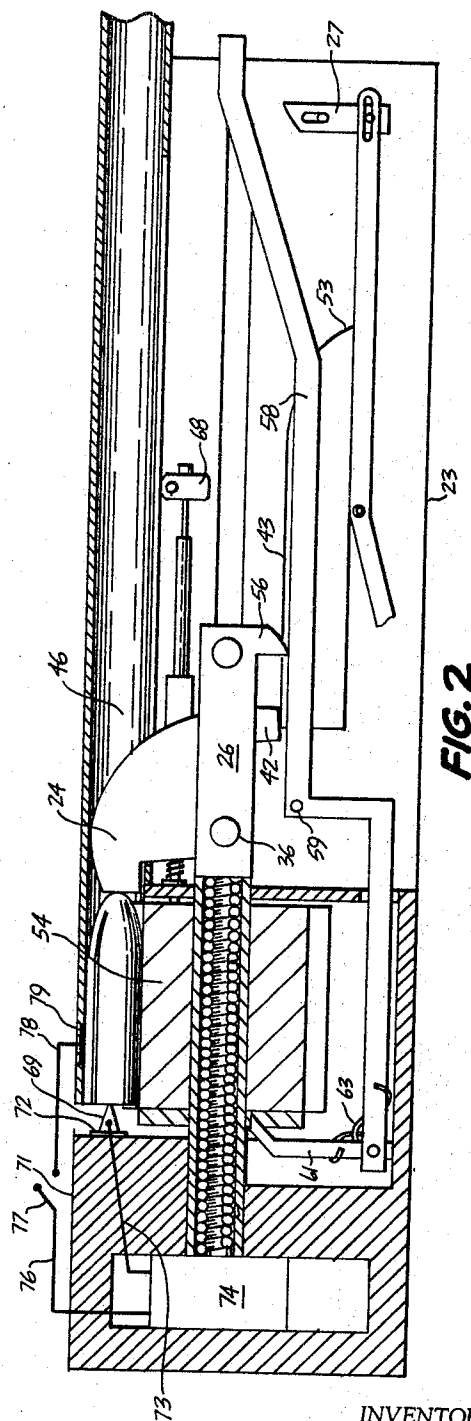


FIG. 2

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3 Sheets-Sheet 2

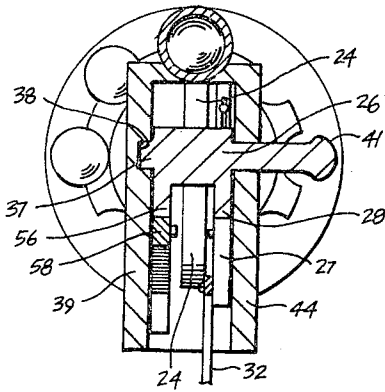


FIG. 3

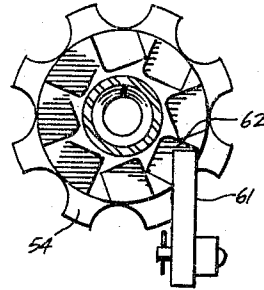


FIG. 4

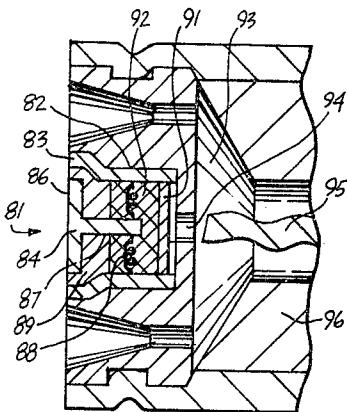


FIG. 5

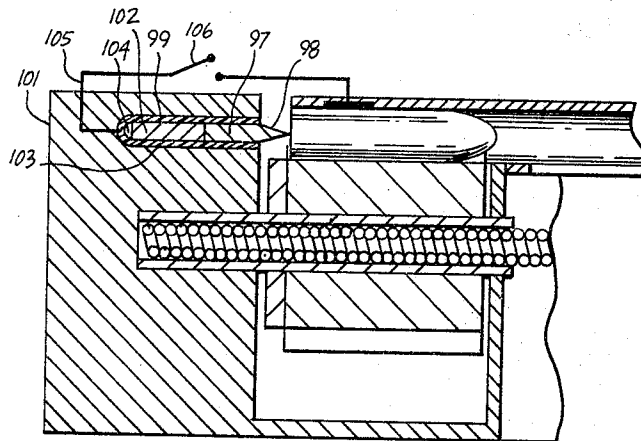


FIG. 6

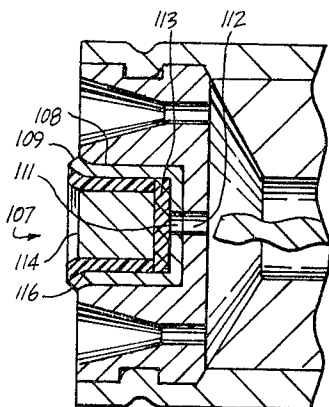


FIG. 7

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3 Sheets-Sheet 3

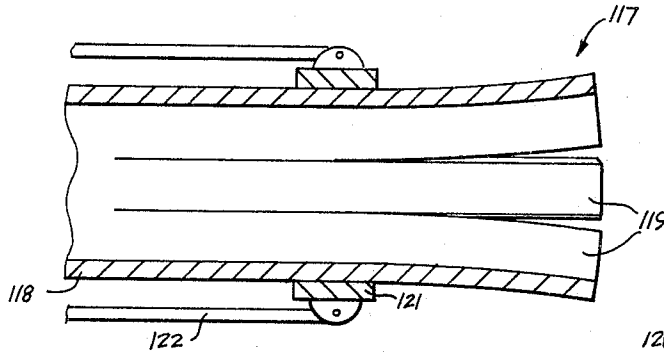


FIG. 8

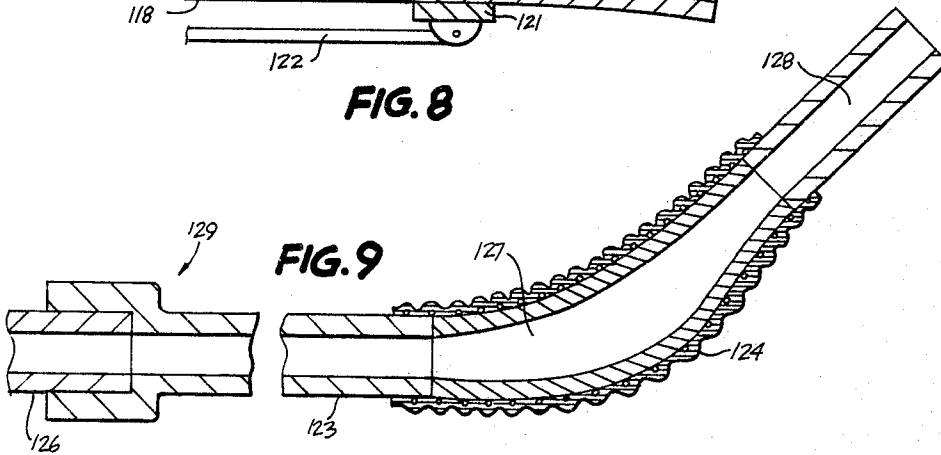


FIG. 9

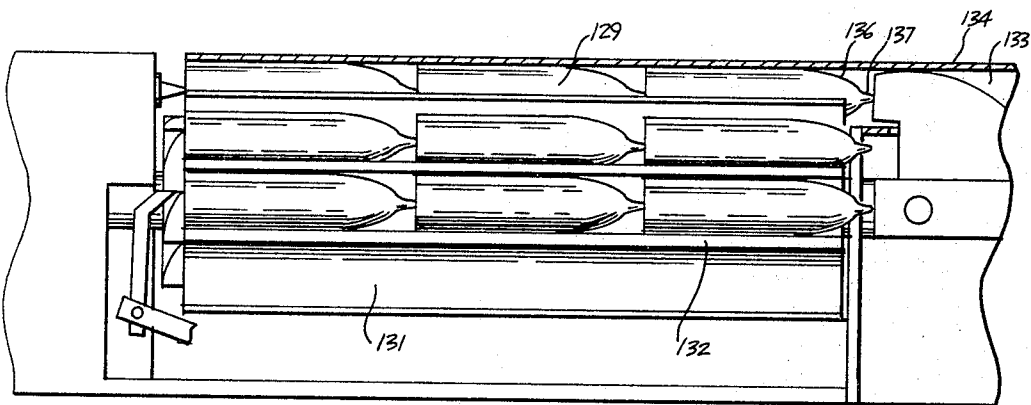


FIG. 10

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3,329,063

ROCKET MACHINE GUN

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Filed Apr. 14, 1965, Ser. No. 448,001

12 Claims. (Cl. 89—1.801)

This application is a continuation-in-part of copending application Ser. No. 304,844, filed Aug. 27, 1963, "Rocket Machine Gun," now abandoned.

This invention relates in general to machine guns and more particularly to a rocket machine gun wherein novel construction features are employed to load and fire the rockets and control their launching towards the target.

The use of miniature rockets in small arms weapons such as a machine gun achieves unusual ordnance effects. It eliminates the traditional parameters under which a machine gun must operate whereby a great number of advantages are realized. There can be an elimination of more than 90% of the recoil associated with a conventional weapon of the same caliber. There is virtually no muzzle blast and the weapon will not overheat. A large number of moving parts can be eliminated as no spent cartridges must be ejected from the weapon. Precision manufacturing is unnecessary for producing the barrel and related components. The barrel can be made of relatively thin wall tubing as it does not need to contain the pressure rise of the propellants and rifling is unnecessary. A very high rate of fire can be achieved as two or more projectiles can be traveling in the launching tube simultaneously, in fact salvos of projectiles can be launched at once from the same tube. Very unusual projectile feed mechanisms can be used. Most important the highest projectile velocity is achieved in the target impact area rather than just after leaving the gun barrel.

When a rocket is fired it accelerates without recoil if porting means are provided in the launching tube for allowing the gases of combustion from the propellant grain to escape. If necessary a short portion of the launching tube, e.g., the inner end, can be left unported to provide some pressure blow back to actuate the reloading mechanism. Even using an unported barrel, since only a portion of the propellant burns while in the barrel, unlike a bullet wherein most of the propellant is burned before the bullet leaves the barrel, the kick back is considerably less.

By using a ported launching tube, pressure build up from the gases of combustion is eliminated. This prevents muzzle blast as associated with conventional small arms type weapons.

The rockets of the present invention do not use a tight fit in the launching tube. They are self propelled therefore do not need to seal the gases of combustion in the barrel as does a bullet. The launcher therefore does not overheat from repeated firing because there is only a minimum of friction between the projectile and the launching tube. Additionally, only about 10% of the propellant charge is expended while in the launching tube, so that there is very little heat of combustion occurring in the barrel before the rocket is launched. The result of being able to eliminate the seal between the projectile and the barrel wall, and having most of the combustion of the propellant occurring outside the barrel, is that the problem of overheating is virtually eliminated.

When a rocket is fired all components leave the weapon through the launching tube, and there is no spent cartridge to be ejected. Thus, the machine gun can be designed with fewer operational movements, and, consequently, fewer moving parts, thereby saving cost, weight, and mechanism motion.

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Since there is no cartridge case associated with the rockets, which must be restrained during firing and thereafter ejected from the firing chamber, novel methods of feeding miniature rockets to the firing chamber may be employed.

Since the rockets are self stabilizing, the barrel does not need to be precision machine to provide rifling and a tapering longitudinal barrel wall cross section thickness typical of most machine guns. In addition since the barrel does not need to contain the pressure rise of the propellant, and does not need rifling, simple thin wall tubing having a smooth bore and constant diameter will suffice as a launching tube.

The use of rockets in a machine gun provides a much higher rate of fire than can be achieved with bullets since the weapon is not limited by the rate of insertion and ejection of cartridges nor by requiring the bullet to clear the end of the barrel before the next projectile is fired. In automatic weapons of contemporary design, the bullet must be almost out of the barrel before blow back pressure is siphoned off to actuate the ejection and reloading mechanism. This is to allow the bullet to absorb the largest amount of energy possible from the pressure rise of the propellant before it is ejected from the barrel. Likewise, the firing chamber cannot be opened to permit the insertion of a new cartridge until the bullet has cleared the muzzle in order to maintain the pressure rise. Rockets on the other hand do not need to absorb energy in the launching tube as they are self propelled and therefore do not need to wait for the preceding rocket to clear the muzzle. Neither does the firing chamber need to be pressurized, therefore the reloading mechanism can operate faster. Two or more projectiles can be in the launching tube simultaneously thereby permitting a much higher rate of fire and eliminating unnecessary mechanisms. Actually, in line salvos of rockets can be launched at the same time by a single operating mechanism wherein each rocket ignites the rocket either immediately in front of or behind it.

The most valuable characteristic of a rocket for use as a kinetic energy kill mechanism, one which cannot be obtained from any other type of projectile, is the fact that the highest velocity of the rocket is achieved at some point after launch, and not at the end of the launching tube, whereby the highest energy of the projectile is delivered in the area of the target and not immediately upon launch. Bullets, conversely, have their maximum velocity upon emergence from the barrel and they continually decelerate until they strike the target. The use of rockets, therefore, provide a more ideal type weapon for anti-personnel use, since they can be designed to deliver their highest energy to the victim.

Rockets have traditionally been used to deliver a payload, such as incendiary or high explosive, but never as an anti-personnel kinetic kill mechanism. Some of the unique advantages particular to this use which rockets obtain, that cannot be found in other types of small arms weapons, is that they are less dangerous at very close range than they are at a distance from the end of the launching tube. When fired from launching tubes the length of the conventional pistol, they have not gained sufficient velocity at the end of the barrel to penetrate the human body, thus accidents at close range are much less severe. An inverse of the effect caused by conventional small arms type weapons. Further, the use of rockets provides a tracer to the point of highest projectile velocity. Additional tracer material can be provided to effect a tracer for the complete trajectory. With the relaxation of parameters provided by using miniature rockets, the present weapon creates a new concept in small arms weapons.

Heretofore, the lower limit size for which rockets useful for ordnance purposes could be constructed has generally

been considered to be on the order of a few inches in diameter and no less than about one foot in length. These rockets are generally launched by means of apparatus especially constructed for the purpose. Heretofore, the large size and launching characteristics of rockets have precluded the use of launchers comparable in size to small arms type weapons. With the production of a rocket, or self-propelled projectile, having a size corresponding to the ammunition usually employed in weapons comparable to side arms and rifles, a machine gun for firing rockets is possible. The size range which is appropriate for these purposes is comparable to the size range of conventional side arm, rifle, and shotgun calibers. This would be below about one inch in diameter and down to about .2 of an inch in diameter, i.e., 10 gauge to .22 caliber, and with a maximum length of a few inches, with a minimum length being about one inch as represented by a generally cylindrical body. For present purposes the rocket projectile in the indicated size range will be termed miniature rocket to distinguish from the previous devices.

The rockets for use in this invention are capable of performance quite different from those of a bullet. They leave the barrel typically at 100 feet per second and can obtain velocities up to Mach 3 (3300 feet per second at sea level). They can achieve spin rates approximately between 0.2 to 0.8 radians per caliber (0.3 revolutions per foot to 8 revolutions per foot). The maximum velocity is achieved at burnout. The distance to burnout is controllable and ranges from 10 feet to 150 feet. The miniature rockets weigh less than 1 gram to more than 300 grams. A typical 13 mm. rocket weighs approximately 15 grams and achieves a burnout velocity of approximately 1500 feet per second at 50 feet.

The present invention provides a machine gun exceptionally suitable for launching miniature spin stabilized rockets from aircraft traveling at high velocities. With conventional bullet projectiles, a number of problems have arisen in attempts to fire these rounds from high velocity aircraft. The round is subjected to relatively large aerodynamic forces during launch and in many cases the spin rates achieved by bullets are not sufficient to stabilize the round. The spin rate required for stability is directly proportional to air speed and thus to launch a stable projectile into a high velocity wind stream requires a greater spin rate than that required to launch a projectile into a zero velocity environment. With the tremendous spin rates obtainable by the rockets, which can approach 15,000 revolutions per second, a very stable high velocity projectile is provided.

In brief, the invention is an improved rapid fire launching means for miniature rockets wherein the rocket attains spin stabilization prior to launch. The combination comprises a housing and a launching tube having muzzle and breach ends, the breach end being supported by the housing, rocket feed means located in the housing for intermittently aligning at least one rocket with the bore of the launching tube at the breach end, hammer means slideably related to the launching tube located in the housing, the hammer means having a path of motion entering the launching tube forward of the breach end and traveling rearwardly in the tube toward the rocket feed means and a retracing motion forward in the launching tube to a retracted position in the housing, the hammer means being driven to the retracted position by the rocket leaving the launching tube, a trigger means controlling the hammer means, and a feed cycling actuated by the motion of the hammer means. In operation, one or several rockets are aligned with the launching tube by the feed means. The trigger is pulled and the hammer travels rearwardly in the launching tube to strike the first rocket on the nose. This drives the rear end of the rocket onto the firing pin, either fastened to the nose of the successive rocket or to the housing. Then the rocket spins up and develops thrust to travel down the launching tube driving the hammer means ahead of the first rocket until the hammer means

is retracted into the housing permitting the rocket's free passage therepast. The movement of the hammer ahead of the rocket operates a lever in the feed cycling mechanism which cycles the rocket feed element. Thus one or several rockets can be fired with a single strike of the hammer.

The hammer retards the forward motion of the rocket for a portion of the travel in the launching tube but allows angular rotation to increase normally. The result is that the rocket projectile spins up before it passes through the muzzle and thus may be successfully launched into a high velocity wind stream from a relatively short launcher. The hammer retarding force and the period of application of this force may be altered to provide any desired "pre-spin." However, if the retarding force does not act over a substantial length, greater than 3 calibers, "pre-spin" has experimentally been found to be negligible. An alternative, not suitable for some weapon applications, but which may be easily done in this invention, is to extend the launcher length. It is not possible to easily extend the launcher length in conventional small arms type weapons since an effective pressure seal must be maintained. For rockets, the extension does not need to be sealed as the round does not depend on pressure build up in the barrel.

An object of this invention is to provide a rapid fire launching means which may be used to fire miniature rocket projectiles.

Another object of this invention is to provide a machine gun for miniature rockets which provides restraint to the rocket during launch until it has become spin-stabilized.

A further object of this invention is to provide a machine gun wherein energy may be extracted from the motion of the hammer to reload subsequent rounds into the firing chamber.

And still another object of the invention is to provide a small arms weapon wherein the high impact energies of miniature rockets may be utilized in a rapid fire kinetic energy kill mechanism.

Still another object of this invention is to provide a weapon wherein a number of projectiles may be traveling in the launching tube at the same time.

Other objects and advantages of the invention will be set forth in the following description of the invention and illustrated in the accompanying drawings of which:

FIGURE 1 is a side elevation partially in section of an automatic machine gun illustrating the present invention with the hammer in a forward cocked position.

FIGURE 2 is a side elevation partly in section of an automatic machine gun illustrating the present invention with the hammer in a rearward position and means for firing the rocket by electrical ignition.

FIGURE 3 is a front section of the automatic machine gun of the present invention taken at 3—3 of FIGURE 1.

FIGURE 4 is a rear section of the automatic machine gun taken at 4—4 of FIGURE 1 showing only the feed cylinder and the advancing panel.

FIGURE 5 is a partial section in side elevation of a rocket for use with the electrical ignition system of FIGURE 2.

FIGURE 6 is a partial section in side elevation of an automatic machine gun of the present invention having an alternative form of electrical ignition.

FIGURE 7 is partial section in side elevation of a rocket for use with the electrical ignition system of FIGURE 6.

FIGURE 8 is a side elevation in section of a muzzle for use with the automatic machinegun of the present invention.

FIGURE 9 is a side elevation in section of a barrel for use with the automatic machinegun of the present invention.

FIGURE 10 is a partial section in side elevation of an alternative embodiment of the feed mechanism of the machinegun of the present invention having an in-line salvo of rockets prepared for firing.

Referring to FIGURE 1 there shown is an improved

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rapid fire rocket launching means such as a machine gun 21 for miniature rockets. A rocket 22 is shown located in the rear end of the housing 23 ready for firing. The power means including hammer 24 and the traveling carriage 26 are shown at the forward extent of their cycle of motion. The carriage is restrained in the forward position by the trigger link 27 engaging the projecting foot 28 (FIGURE 3) of the carriage on the far side of the cam 29. The spring 31 is secured at one end to the carriage and at the other or rear end to the housing. When the hammer is forward and locked by the trigger link, the spring is stretched in tension. When the trigger (not shown) is pulled the trigger bar 32 is made to rotate clockwise about the pivot pin 33 by appropriate cams and linkage. The trigger link is depressed downward with respect to the housing through the linkage pin 34 interconnection with the trigger bar. This releases the carriage and permits the spring to draw the carriage rearward in the housing toward the rocket in position for firing. The carriage has pins 36, 37 projecting from the sides of the carriage (FIGURE 3) which ride in guides 38 formed in the wall 39 of the housing. In one wall of the housing slots can be cut all the way through to permit one of the pins to form a handle 41 by which the hammer mechanism can be manually operated and cocked. As the carriage moves rearwardly in the housing the foot 42 of the hammer engages with the cammed surface secured to the far wall 44 (FIGURE 3) of the housing. The hammer rotates counter-clockwise about the pivot pin 36 which secures the hammer to the carriage, up into the launching tube 46 through the slot 47 in the lower side in line with the nose 48 of the rocket. The face 49 of the hammer strikes the nose of the rocket driving it rearward onto the firing pin 51 projecting in line with the axis of the rocket from a rear portion 52 of the housing. This ignites the rocket.

Due to the canted orifices of the rocket nozzle, the rocket has an angular thrust moment imparted to it whereby the rocket rotates around the longitudinal axis. The nose of the rocket bearing against the head of the hammer forms a needle bearing permitting the rocket to "spin up" relatively free of restraint. Concurrently the rocket develops forward thrust whereby the hammer is driven forward in the housing.

Reference now to FIGURE 2 will aid in further understanding the operation of the invention. The hammer 24 is kept from rotating about the pivot pin 36 by contact of the foot 42 with the cam surface 43. This prevents the hammer from rotating out of the barrel 46 until the hammer foot reaches the end 53 of the cam. The hammer is driven by the projectile leaving the launching tube which is turn drives the carriage to retrace the path of motion traversed in moving rearward in the housing. As the carriage moves forward it stores energy in the spring 31. After the rocket has traveled forward and cleared the feed cylinder or carrier means 54, the foot 56 of the carriage engages the inclined face 57 of the cycling lever 58 depressing it and forcing it to rotate clockwise about the pivot pin 59 attached to the housing. This forces the pawl 61 upward whereby it engages a ratchet 62 (FIGURE 4) located on the feed cylinder 54 causing the cylinder to index another round into the chamber in line with the axis of the launching ready for firing. The pawl is kept in contact with the ratchet by a spring 63; for purposes of illustration a simple wire spring is used.

A positive indexing means is provided to insure that the cylinder is stopped with the rockets in line with the bore of the launching tube. This is achieved by a spring loaded rod 64 (FIGURE 1) which rides in a sleeve 66 secured to the far wall 44 of the housing. The rod engages spaced holes in the front face 67 of the cylinder at the proper intervals to align the rocket with the launching tube. The rod is withdrawn momentarily from the indexing hole by the carriage tripping lever 68 on its forward

travel in the housing whereby the cylinder is unlocked to permit it to rotate. As soon as the carriage passes, the rod snaps back on the face of the cylinder on the flat surface until the cylinder has turned sufficiently whereby the next indexing hole is engaged.

The carriage travels forward until the hammer has obtained its maximum potential energy and the foot 28 (FIGURE 3) of the carriage engages the trigger link 27. If the trigger is held in the fire position, the link will not arrest the carriage, and it will recycle, firing the next rocket or round of rockets. The energy stored in the spring is subtracted from the translational motion of the projectile in the barrel, but results in projectile spin-up. The barrel should have a length of at least 10 rocket diameters after the hammer retarding force ceases to act for best accuracy.

Electrical ignition of the rockets may be achieved by use of a battery or a piezo electric crystal spark generator. Typical percussion firing is shown by the structure of FIGURE 1 in conjunction with the rockets of the previously referenced copending application. The battery type ignition is illustrated in FIGURE 2 of the drawings and comprises a firing pin 69 mounted on a rear end portion 71 of the housing 23 and insulated 72 from it. An insulated lead 73 extends from the firing pin to the battery 74 and a second insulated lead 76 passes through switch 77 controlled by the firing trigger (not shown). This serves as a safety. A simple electrical switch which is closed by the trigger compressing it against a handle behind the trigger, as on conventional machine guns, would work satisfactorily. The lead 78 from the switch is electrically connected to a spring loaded wiping contact 79. As the rocket is driven rearwardly by the hammer onto the contact, an electrical circuit is established between the firing pin and the wiping contact firing the primer in the rocket.

FIGURE 5 shows in detail a portion of a rocket and a primer for use with battery ignition. With this type of ignition a different primer cap is used from that for percussion ignition. The primer 81 is inserted and secured in the primer cavity 82 as a unit and secured by a friction fit or by metal working the lip of the cavity over the edge of the primer. The primer is comprised of a cup 83 having a center ignition contact 84 having a T cross section. The configuration of the contact provides a large surface area 86 or target for the firing pin contact while the small diameter shank 87 permits space for an electrical heater wire 88 to bridge between the cup and the central contact. The contact is secured in position by a strong epoxy filler 89 while the lower end of the cup is covered by a weaker layer of epoxy 91. The volume of space surrounding the shank of the contact, and the heater wires, between the layers of epoxy, is filled with a flash mix 92.

In operation, the hammer drives the rocket onto the contact pin which is sharply pointed to penetrate the contact plate for good electrical continuity. When the circuit is completed in the rocket, through the metal case and the contact plate, the heater wires are heated by the current thereby lighting the flash mix. The heat and gases of combustion burst through the layer of epoxy 91 and enter the combustion chamber 93 through the communication port 94 in the nozzle igniting the fuse 95 which lights the propellant grain 96 uniformly along its length.

FIGURE 6 shows an alternative form of electrical ignition wherein a piezo electric crystal generator can be substituted for the battery.

The firing pin at the rear portion of the housing is modified whereby a rod 97 with a sharp point 98 is located in an insulated hole 99 in the rear portion of the housing 101. Directly behind the pointed firing rod is a piezo electric crystal 102 in electrical contact with the firing pin. The crystal is also insulated 103 from the housing. At the rear end of the crystal, in electrical contact therewith, is

a metal plate 104 which has an insulated electrical line 105 taken off to complete the electrical circuit. Safety switch means 106 are located and connected with the trigger such that when the trigger is pulled to permit the cycling of the rounds the electrical safety system is also closed as described earlier. The rocket is held in electrical contact with the electrical contact ring. When the hammer hits the nose of the rocket, the rocket is driven onto the firing pin and the sharp point of the firing pin pierces the primer cap so that clean metal establishes the electrical contact. At the same time, the piezo electric crystal is squeezed producing an arc which is delivered to the primer cap through the electrical circuit which is completed through the firing pin and contact ring. Crystals suitable for use in this embodiment of the ignition means are made by the Clevite Co. of Cleveland, Ohio.

The type of primers 107 are suitable for use with this type of ignition system. They are inserted in the primer cavity 108 of the nozzles in electrical contact therewith. The primer cup 109 has a hole 111 in the bottom which aligns with the communication port 112 of the nozzle. A layer of flash mix 113 fills the bottom of the primer cup and is disposed between the cup and an electrical contact plate which is separated from the cup but secured therein by an insulation liner 116.

When the piezo electric crystal is compressed by the action of the hammer on the rocket and the firing pin, an electrical potential is established across the crystal faces contacting the pin 97 and the contact plate 104 (FIGURE 6). The potential arcs across the gap between the primer cup 109 and the contact plate 114 igniting the flash mix which lights the propellant similar to the primer just described.

The barrel of the machine gun can be of circular cross section, but lands and grooves can be provided to prevent the build up of carbon in the barrel or solid matter from jamming the round or otherwise hindering the progress of rockets passing through the barrel. The lands and grooves provide a receptacle where waste can be accommodated. The carbon or the dirt is displaced into the grooves between the lands by the rockets as they travel down the barrel. In actuality, any cross section of the barrel can be used, even square, since the rockets do not depend upon pressure build up in the barrel behind the projectile.

Miniature rockets also permit novel type barrels to be utilized as shown in FIGURE 8, wherein the muzzle 117 of the barrel 118 is fluted with the individual tangs 119 given a slight outward flare. A longitudinally movable slip ring 121 or a second barrel even, coaxially surrounds the tangs and is linearly controllable by means such as push rods 122. When the slip ring is moved to a fully forward position, the tangs are compressed to choke down the muzzle of the barrel. The tangs are flared with such a curve that when choked down the tanks form accurate guide tracks of the emerging projectiles. The choked muzzle provides a high degree of accuracy. As the slip ring is moved rearward from the muzzle, the dispersion of the emerging projectiles increases providing a scatter shot weapon. When used in conjunction with the machine gun, this barrel arrangement provides a weapon which is freely and infinitely changeable from accurate to scatter shot almost instantaneously without cessation of firing. Such a weapon can be used on a pinpoint target or for support and covering fire whereby a general area can be saturated. Since the weapon does not overheat from the effect of friction or the gases of combustion, and no mechanism is needed to eject the expanded cartridges, a very high rate of sustained controllage fire can be maintained.

Another type of barrel which can be used with the present invention is shown in FIGURE 9. Since rockets are self propelled and do not need a seal between the wall of the barrel and the projectile, a launching tube 123 considerably larger in diameter than the projectile can be

used. This permits a bend 124 in the launching tube whereby the projectiles may be fired around corners. In practice the projectile is launched in a section of the proper diameter tube 126 to obtain stability and forward velocity. Then it is admitted to a larger diameter portion 127 being bent in the direction desired to turn the corner and then funnelled into a proper diameter tube or muzzle 128 to regain stability before free flight towards the target. The bent portion of the tube is a diameter only large enough to permit clearance of the projectile and can be made of flexible tubing such as common garden hose. The weapon and ammunition can remain in one position while the barrel is swung from target to target or around corners. Due to the fact that the tolerances of the barrel are not critical, barrel extensions, or variable type barrels can be added to the launching tube of the machine gun by a simple slip or coaxial joint 129. No lands and grooves have to be matched or does there have to be a pressure seal. The weapon is very versatile.

Due to the novel firing mechanism as employed in this invention, a unique approach to increasing the rate of fire can be utilized. The miniature rockets can be fired in salvo of more than 1 and up to about 6 at a time. Larger numbers become difficult because such a large spring would be necessary for energy transfer between all the rockets to insure that each one is ignited. The rockets might not be able to drive the hammer back to a cocked position. In any event the performance would be degraded if too large a spring were used. Electrical ignition allows use of a lighter spring whereby larger salvos may be fired.

The invention with respect to salvo firing miniature rockets is shown in FIGURE 10. Three rockets 129 are shown loaded in each indexing slot 131 of the feed cylinder 132. The series of rockets are aligned with the axis of the bore 133 of the launching tube 134. The nose 136 of each rocket has a projection 137 thereon formed as an integral portion of the case in the shape of a firing pin. The primer of each rocket is aligned with the firing pin formed on the other rockets or the firing pin 138 affixed to the housing of the machine gun. The rockets are aligned in touching relation, nose to primer, by guide walls (not shown) at the front and rear ends of the cylinder perpendicular to the axes of the rockets. This close alignment of the rockets provides the most efficient transfer of energy along the train of rockets to cause ignition. If the rockets are not in close relation, excessive energy must be delivered to the rockets by the hammer to achieve the same effect. When the hammer contacts the first rockets, all of the rockets are driven onto the firing pin immediately to their rear and ignited, e.g., the nose of each rocket penetrates or actuates the primer of the rocket immediately ahead of it and the rearward most rocket is actuated by the firing pin on the housing. Each rocket pre-spins against the rocket ahead of it and combines with the others to push the hammer forward to the recocked position. Any faulty round is carried out of the barrel, except the last one which just continues in the cylinder slot and drops out when it reaches the bottom of the housing.

While changes can be made in the details of construction and methods of fabrication of the miniature rockets of the present invention, without departing from the spirit and scope thereof, it is not to be limited except as defined in the following claims.

We claim:

1. An improved rapid fire launching means for miniature rockets wherein the rocket attains spin stabilization prior to launch therefrom the combination comprising
 - (a) a housing having guide tracks therein and further including a hammer carriage which travels in said guide tracks,
 - (b) a launching tube having muzzle and breech ends, said breech end supported by said housing,
 - (c) rocket feed means in said housing for intermittently

- aligning at least one rocket with the bore of said launching tube at said breech end,
- (d) pivotal hammer means in said housing slideably related to said launching tube having a motion cycle whereby said hammer means starts from a position in said housing forward of and external of the breech end of said launching tube and moves into the bore of said launching tube and rearward to strike a rocket in position for firing on the forward end thereof and returns to said starting position by the passage of said rocket out of said tube,
- (e) ignition means including a firing pin relatively rigidly secured to a portion of said housing rearward of the rocket in line with the longitudinal axis thereof, and
- (f) trigger means connected to said housing controlling said hammer means.
2. The rapid fire launching means of claim 1 wherein the rotation of said hammer in said carriage into and out of said launching tube is controlled by a cam means in said housing fixedly related to said guide tracks.
3. The rapid fire launching means of claim 2 wherein said rocket feed means is actuated by the motion of said hammer means.
4. A rocket machine gun for miniature rockets comprising
- (a) a housing,
- (b) a launching tube having muzzle and breech ends, said breech end supported by said housing,
- (c) rocket feed means in said housing including a rocket indexing cylinder having a scalloped external surface for intermittantly aligning at least one rocket with the axis of the bore of said launching tube,
- (d) hammer means in said housing slideably related to said launching tube for translation movement therein having a cycle of motion whereby said hammer means enters the launching tube to strike the forward end of said rocket and retracts from said launching tube to permit passage of the rocket out of said tube,
- (e) cylinder indexing means in said housing for controlling said rocket feed means, said rocket feed cylinder actuated by the motion of said hammer means,
- (f) ignition means including a firing pin relatively rigidly secured to a portion of said housing rearward of the rocket in line with the longitudinal axis thereof, and
- (g) trigger means connected to said housing controlling said hammer means.
5. A rocket machine gun for miniature spin stabilized rockets comprising
- (a) a housing,
- (b) a launching tube having muzzle and breech ends, said breech end supported by said housing,
- (c) rocket feed means in said housing including a rocket indexing cylinder having a scalloped external surface for intermittantly aligning at least one rocket with the axis of the bore of said launching tube,
- (d) guide tracks in said housing,
- (e) a hammer carriage which travels in said guide tracks,
- (f) a hammer pivotably carried by said carriage,
- (g) cam means controlling the rotation of said hammer in said carriage and formed to rotate said hammer into said launching tube as said carriage moves rearward toward said breech on said guide tracks and when said hammer is driven forward toward said muzzle by the passage of the rocket out of the barrel rotates said hammer out of said launching tube,
- (h) spring means affixed between said carriage and said housing for driving said carriage rearward in said housing,
- (i) rocket feed cylinder indexing means controlled by the motion of said hammer and carriage, said rocket

- feed cylinder actuated by the motion of said hammer and carriage,
- (j) ignition means including a firing pin relatively rigidly secured to a portion of said housing rearward of the rocket in line with the longitudinal axis thereof, and
- (k) trigger means connected to said housing controlling said hammer means.
6. The rocket machine gun of claim 5 wherein said ignition means includes a percussion primer cap located in the center of the rear-end of said rockets.
7. The rocket machine gun of claim 5 wherein said ignition means is electrical comprising
- (a) a battery in said housing having one terminal in electrical connection with said firing pin, said firing pin insulated from said housing, and the other terminal grounded to the casing of said rocket,
- (b) an electrical primer in said rocket suitable for ignition by said battery, and
- (c) safety switch for interrupting the continuity of the resulting electrical circuit controlled by said trigger means.
8. The rocket machine gun of claim 5 wherein said ignition means is electrical comprising
- (a) said firing pin mounted for slight translational movement in said housing and insulated therefrom,
- (b) a piezo electric crystal spark generator having opposing faces cut thereon, supported rearward of said firing pin in said housing, and insulated therefrom, one of said faces in pressure and electrical contact with said firing pin, the other of said faces electrically connected to the casing of said rocket, and
- (c) safety switch for interrupting the continuity of the resulting electrical circuit controlled by said trigger means.
9. The rocket machine gun of claim 5 including a barrel for controlling the dispersion of miniature ballistic rocket projectiles comprising
- (a) a fluted barrel muzzle having a multiplicity of tangs formed thereby, said tangs having an outward flare from the axis of said barrel,
- (b) tank control means, coaxially surrounding fluted barrel muzzle, and
- (c) means for sliding said control means laterally along said tangs.
10. The rocket machine gun of claim 5 including a barrel for firing miniature rockets comprising first, second, and intermediate portions, said first portion for initially firing said rocket, said intermediate portion being a flexible tubing of larger diameter than said first portion, and said second portion having a funneled diameter corresponding to said first portion.
11. A rapid fire rocket weapon having fore and aft portions comprising, barrel means, a carrier means for a plurality of rockets, an ignition means mounted rearwardly and adjacent thereto, power means mounted on said weapon for forcing a rocket rearwardly in said carrier means from a relatively stationary position therein and against the ignition means to ignite the same, said power means including means permitting longitudinal advancement thereof relative to the barrel of said rocket weapon away from said carrier means by the forward motion of an ignited rocket, means removing the power means from the path of the ignited rocket upon termination of the longitudinal advancement of said power means and further including means for translating the longitudinal movement of said power means through a means associated therewith to actuate the carrier means and thereby align an adjacent rocket positioned in said carrier means with said ignition means.
12. A rapid fire rocket weapon having fore and aft portions comprising, barrel means, a revolvable carrier means for a plurality of rockets, an ignition means mounted rearwardly and adjacent thereto, power means mounted on

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said weapon for forcing a rocket rearwardly in said carrier means from a relatively stationary position therein and against the ignition means to ignite the same, said power means including means permitting advancement thereof relative to the barrel of said rocket weapon away from said carrier means by the forward motion of an ignited rocket, means removing the power means from the path of the ignited rocket upon termination of the advancement of said power means and further including means for translating the movement of said power means through a means associated therewith to rotate the carrier means

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and thereby align an adjacent rocket positioned in said carrier means with said ignition means.

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