J. H. PARSONS.

TOY CENTRIFUGAL GUN.

APPLICATION FILED JUNE 26, 1919.

1,356,466. Patented Oct. 19, 1920.

3 SHEETS—SHEET 1.

Fig. 1.

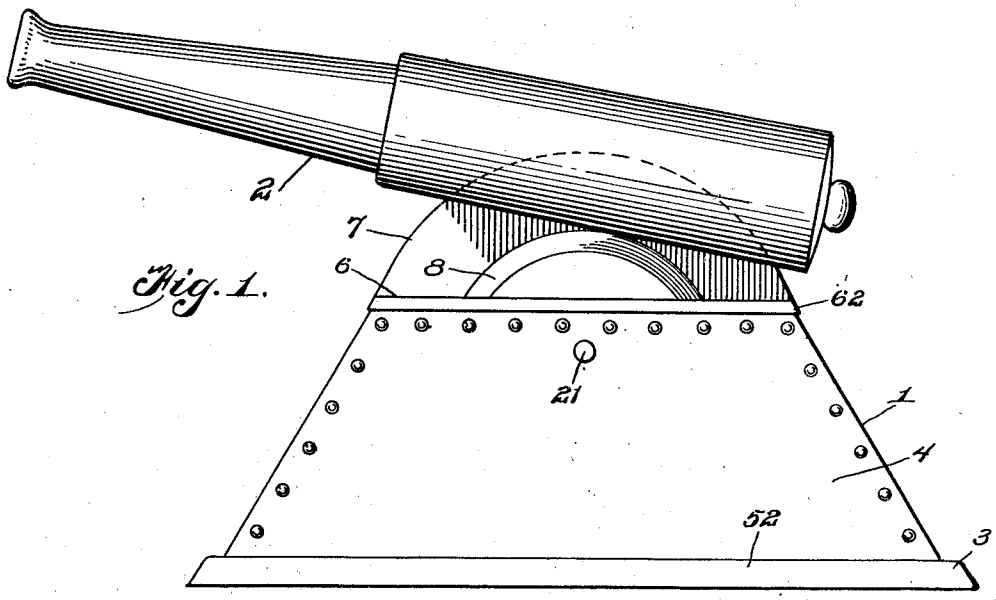
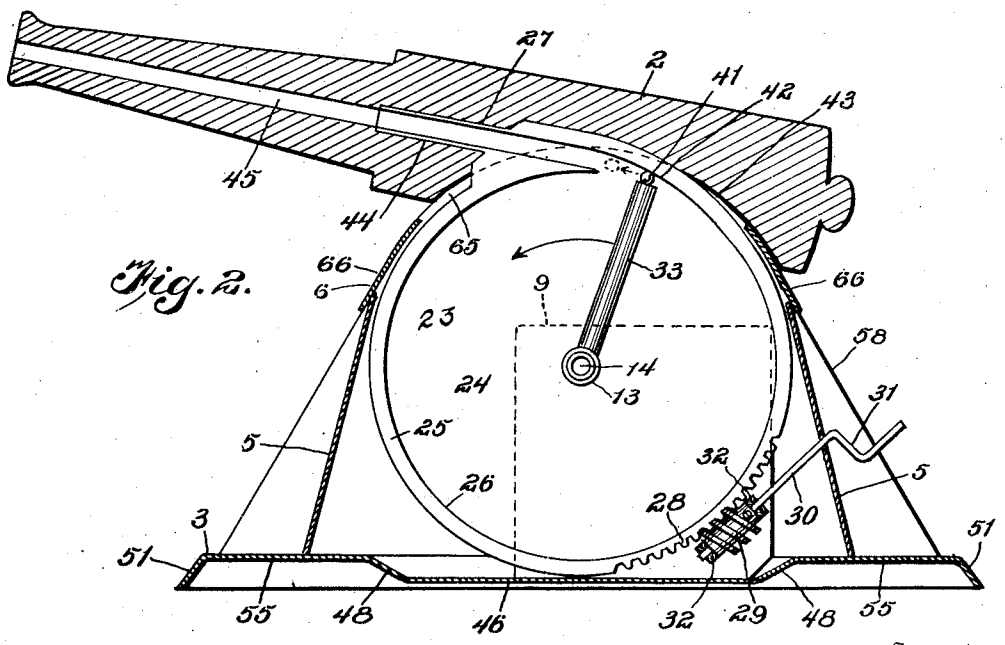


Fig. 2.



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3 SHEETS—SHEET 2.

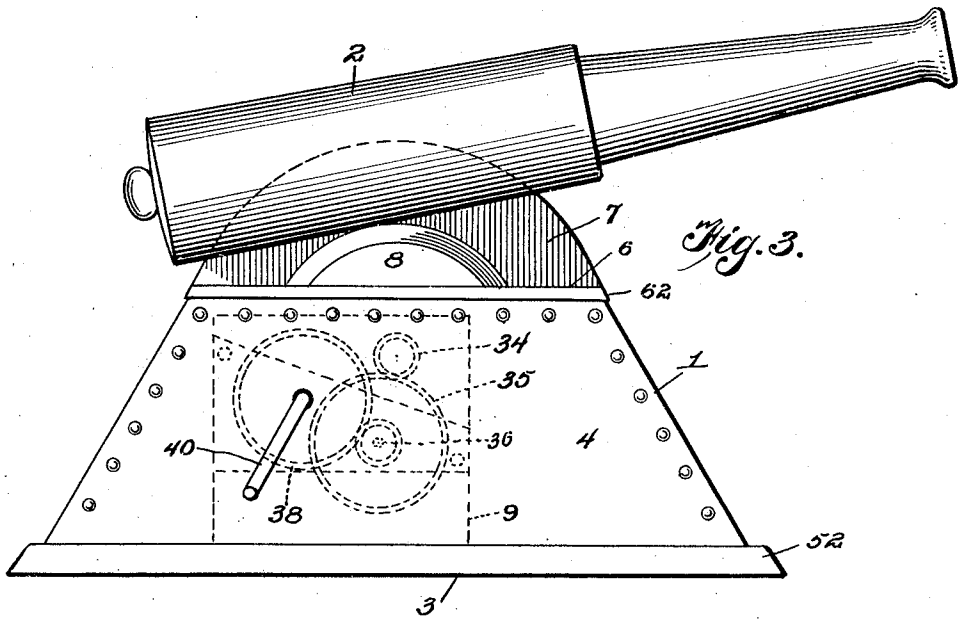


Fig. 3.

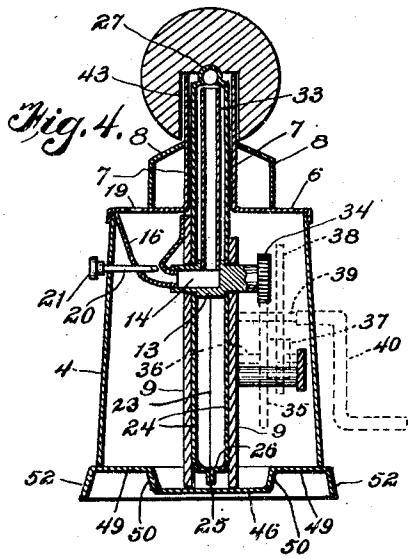
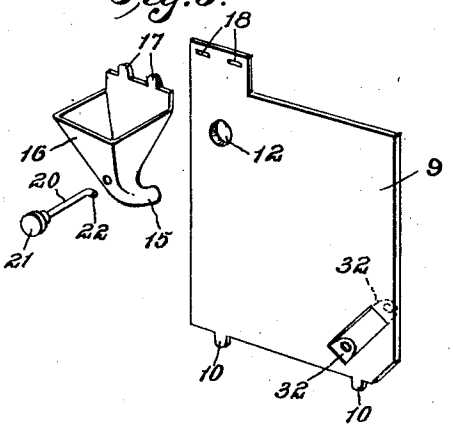


Fig. 4.

Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

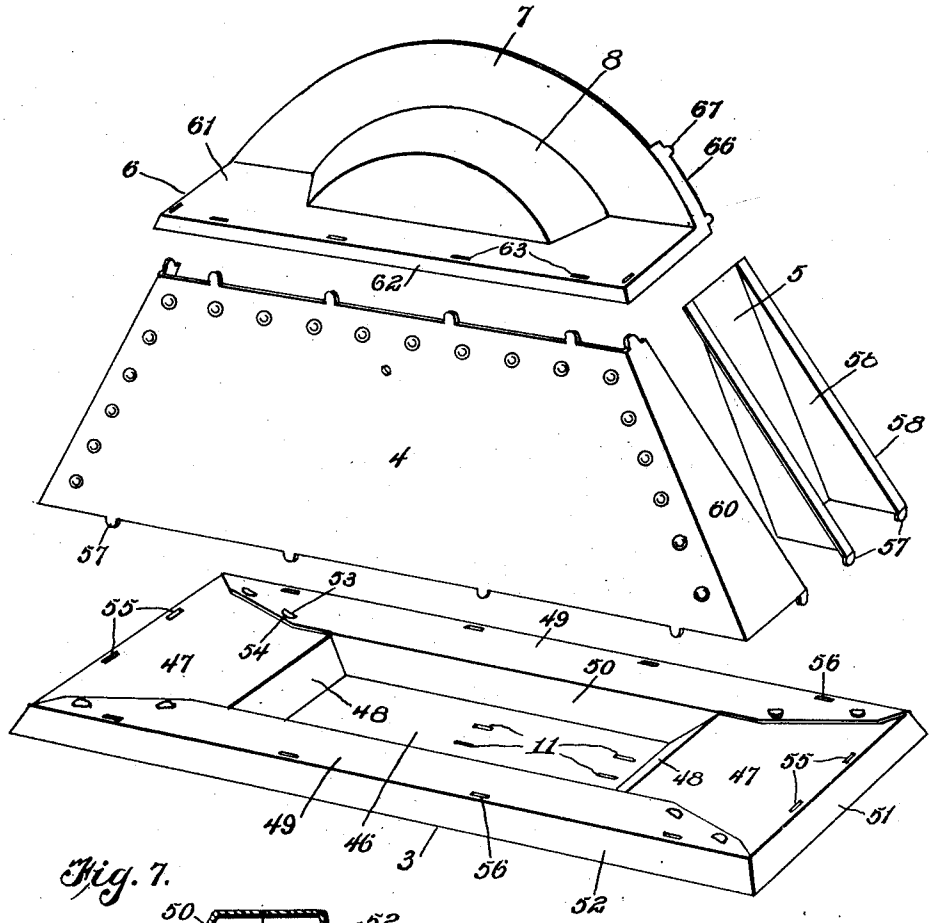


Fig. 7.

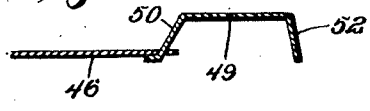
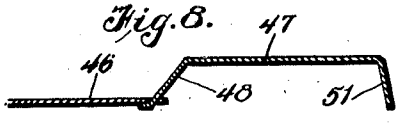


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN H. PARSONS, OF RIDLEY PARK, PENNSYLVANIA, ASSIGNOR OF ONE-FOURTH TO DANIEL J. NORMOYLE, OF PHILADELPHIA, PENNSYLVANIA, AND ONE-FOURTH TO ARTHUR C. BUNNELL, OF RIDLEY PARK, PENNSYLVANIA.

TOY CENTRIFUGAL GUN.

1,356,466. Specification of Letters Patent. **Patented Oct. 19, 1920.**

Application filed June 26, 1919. Serial No. 306,975.

To all whom it may concern:

Be it known that I, JOHN H. PARSONS, a citizen of the United States, residing at Ridley Park, in the county of Delaware and State of Pennsylvania, have invented new and useful Improvements in Toy Centrifugal Guns, of which the following is a specification.

This invention relates to toy guns, and particularly to a toy gun of a type wherein small shot or other missiles may be discharged through the action of centrifugal force resulting from the rapid motion of a rotary impeller.

The main object of the invention is to provide a simple, reliable and efficient construction of gun mechanism which may be produced at a comparatively low cost.

Another object of the invention is to provide a casing and mount for the gun which is also adapted to be produced at a low cost, and which affords a material saving in time and labor in assembling the parts thereof.

The invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a view in elevation looking toward one side of the gun.

Fig. 2 is a central vertical longitudinal section through the gun.

Fig. 3 is a view similar to Fig. 1, looking toward the opposite side of the gun.

Fig. 4 is a vertical transverse section taken on a line through the hopper and the axis of the impeller.

Fig. 5 is a perspective view of the hopper, feed controller and one of the frame plates, showing the same disconnected but in related position.

Fig. 6 is a similar view of disconnected but relatively arranged parts of the gun carriage or mount.

Fig. 7 is a detail transverse section through the base of the carriage or mount.

Fig. 8 is a detail longitudinal section through the same.

In the practical embodiment of my invention I provide a toy gun of the character described which may be mounted for use and operation in any preferred way, but which preferably includes a sectional carriage or mount of a novel construction whereby economy of construction is afforded, together with a material saving of time and labor in manufacture and assemblage.

The device as shown comprises a carriage or mount 1, which forms an inclosure or outer casing for the centrifugal impelling mechanism, as well as a steady rest for the barrel 2. The carriage or mount which is preferably of frusto-pyramidal form includes a base 3, side walls 4, end walls 5, and a top or crown wall 6, the said parts being constructed and connected in a manner hereinafter fully described. The top wall 6 is provided with a segmental slot or opening, and extending upwardly from the side walls of this opening are spaced segmental guide plates 7, the upper edges of which are curved on arcs concentric with the hollow shaft or axis of the impeller hereinafter described. Bracing members 8 of any suitable form and construction are disposed upon the outer sides of the plates 7 and are suitably connected therewith and with the top wall 6, whereby the plates 7 are stayed and braced and maintained in fixed and spaced relationship.

Arranged within the hollow carriage or mount 1 is a supporting bracket or bearing pedestal composed of a pair of spaced bracket plates 9, which are supported and held in working position by the operating parts of the gun mechanism and which may be secured at their lower edges to the base 3 in any preferred manner, preferably by providing said bracket plates with tongues 10 which are extended downwardly through slits 11 formed in the base and clenched upon the underside thereof. The plates 9 are provided adjacent to their upper front corners with bearing openings 12 receiving a transverse shaft 13, which is provided upon one side of its longitudinal center with a feed bore or passage 14 opening through one end thereof, the said open end of the passage 14 receiving the tapered outlet tube 15 formed at the vertex of an inverted frusto-pyramidal hopper 16, disposed between one of the side plates 4 and the adjacent bracket plate 9 immediately below the juxtaposed portion of the top wall 6.

The hopper 16 is supported in position by the parts mentioned between which it is disposed and is further held in place by engagement of its outlet 15 with the shaft

13 and by the provision of tongues 17 upon one of its walls which are passed through slits 18 formed upon the coöperating bracket plate 8 and clenched against said plate. The hopper is arranged beneath an inlet opening 19 in the top wall 6 and is designed to receive a supply of the projectiles which are to be discharged, which projectiles are introduced therein through the opening 19. In practice cylindrical projectiles of relatively small size, such as small shot, may be employed, and the hopper may be of suitable size to receive any desired number of these projectiles. The projectiles feed by gravity from the hopper through the tapered outlet 15 into the bore or passage 14 of the shaft 13, the outlet 15 being of a size to permit but a single projectile to feed to the bore of the shaft at a time. For the purpose of regulating the feed of the projectiles from the hopper to the outlet 15 a controller 20 is provided, said controller consisting of a wire rod or stem slidably mounted in guide openings in the hopper and carriage and provided at its outer end with a notch or finger piece 21 and at its inner end with a combined stop and detent portion 22, preferably formed by bending the inner end of the stem at an angle thereto. The detent is arranged to lie across the throat of the outlet 15 to cut off communication between the hopper and outlet and to be moved outwardly to a prescribed extent to open the outlet for the feed of a single projectile thereto at a time. It will, of course, be understood that in the operation of the gun the controller may be manipulated as slowly or rapidly as desired so that the projectiles may be supplied and fired at comparatively wide intervals or in rapid order or succession as desired.

The central portion of the shaft 13 is annularly expanded or enlarged to form shoulders between its center and any portions which contact with the inner walls of the drum or casing of the centrifugal firing device *per se*, the shaft being thereby held against edgewise movement and the ends of the shaft reduced to form journals rotatably fitted in the bearing openings and in corresponding openings formed in the sides of the drum.

The centrifugal firing mechanism *per se* comprises a drum or casing 23 which is substantially rectangular in form and of restricted width, said casing consisting of a pair of counterpart disk-like sections 24 having inwardly projecting portions with abutment flanges 25 lying in contact with one another, said inwardly projecting portions forming an annular track surface 26. The sections of the casing 23 are held in proper position by engagement with the bracket plates, axle and other working parts of the gun mechanism, and may be additionally united in any preferred manner. The two casing sections are provided with counterpart portions forming a discharge nozzle 27, the bore of which intersects the track 26 at a tangent to the circumference of the casing, and at a suitable point the casing sections are also provided with rack teeth 28 for engagement with a worm 29 mounted upon a shaft 30 having an operating crank 31 disposed upon the exterior of the carriage whereby the worm may be rotated in one direction or the other to turn or oscillate the casing on the shaft as an axis for the purpose of raising and lowering or training the barrel 2. The shaft 30 is journaled in one of the end walls 5 and in bearing lugs 32 stamped out from the bracket plates 9.

The bore or passage 14 of the axle 13 communicates at its inner end with an impeller 33, threaded or otherwise fitted at its inner end to the axle and extending radially therefrom within the casing 23. This impeller is adapted to be rapidly revolved by and with the axle 13, which latter is provided for such purpose with a pinion 34 meshing with a gear 35 on a transmission shaft 36, on which shaft is a pinion 37 meshing with a drive gear 38 on an operating or drive shaft 39 provided with a crank handle 40 projecting outwardly at one side of the carriage 1 whereby the gearing may be actuated to revolve the axle and impeller at high speed. The impeller tube 33 is of a diameter sufficiently exceeding the diameter of the projectiles 41 employed to permit the latter to be discharged easily therethrough by centrifugal force when said impeller is revolved, and is of a length slightly less than the radial distance between the axle 13 and portions of the track surface 26 which are concentric with said axle, so that during the greater portion of the movement of the impeller 33 in its orbit of rotation the projectile 41 will ride in contact with the track surface 26 but will be held seated in the end of the tube 33 until it reaches a point in close proximity to the bore of the nozzle 27, arranged to be discharged therethrough. For the purpose of effecting the ready release of the projectile 41 from the tube and its discharge through the nozzle 27, a portion 42 of the trackway 26 is arranged tangentially to the periphery of the casing and leads inwardly from the upper portion of the wall of the bore of the passage 27 so as to gradually merge into the concentric portion of the trackway, in such a manner that as the free end of the impeller tube 33, in its cycle of rotation, approaches the nozzle the distance between the same and the wall of the trackway will be gradually increased, thus freeing the projectile for discharge through the nozzle. By revolving the impeller 33 at high speed

the projectiles entering the passage 14 by gravity will be impelled through the impeller and held between the same and the track surface 26 until the impeller reaches the releasing point when the projectile will be expelled with considerable force through the nozzle 27 and the bore of the barrel 2.

The barrel 2 is formed in the underside of its breech portion with the cavity or recess 43 which is generally of segmental form, and of such a shape as to receive the guide plates 7 and the outer portion of the casing 23, as well as the inner extremity of the nozzle 27. This recess 23 intersects at its forward portion a counterbore 44 which is of somewhat greater diameter than the main bore 45 of the barrel, said counterbore receiving the projecting portion of the nozzle 27. By this construction the barrel 2 is bifurcated to straddle the segmental guide plates 7 and to be detachably connected with the casing 23 through the medium of the nozzle 27, thus allowing the barrel to be readily applied and removed in an obvious manner without the use of auxiliary fastenings, and at the same time coupling the barrel to the casing 23 whereby the barrel may be raised and lowered through the medium of the elevating gear for the purpose of training it upon an object or disposing it to vary the trajectory of the expelled projectile. In practice the barrel may be made of wood or metal, and when made of wood may be painted to simulate a metal gun barrel.

The gun and its carriage in the illustrated embodiment are of a type simulating a siege gun or other gun of the type mounted upon a fixed or stationary support. Within the scope of the invention, this construction may be modified by mounting the gun upon a wheeled or traveling carriage, the essential features of the invention, hereinafter claimed, being retained for the purpose of securing economy of construction and efficiency of operation in either type of construction. In order to enable the parts of the carriage or mount to be economically manufactured and readily and quickly assembled, I preferably construct the component parts thereof in such form and such manner as to enable them to be stamped out of sheet metal and united in a quick and convenient manner. The construction for this purpose may vary in detail, but in the form shown the base 3 is illustrated as consisting of a main section of sheet metal formed to provide the central portion 46 and end portions 47, the said central portion 46 being depressed below the plane of the portions 47 and connected therewith by short inclined walls 48. The formation of the base is completed by side pieces or sections 49 which overlap the adjacent edges of the portions 7 and are provided with downturned flanges or portions 50 extending therefrom toward the side edges of the part 46 and forming therewith and with the parts 48 a rectangular chamber or depression in the central part of the base to receive the lower ends of the brackets and lower portion of the casing 23. The parts 47 and 49 are provided at their outer edges with depending flanges 51 and 52, conjointly forming a border flange around the base and a support conjointly acting with the depressed central portion 46 to rest against the floor or other surface on which the carriage is supported to firmly sustain the base and the portions of the gun mounted thereon. The sections referred to are detachably united in any suitable manner, as by providing certain of such sections with slits 53 receiving bent tongues 54 on the other sections, whereby the parts are securely united. The end portions 47 and side portions 49 of the base are also provided with sets of slits 55 and 56 to receive tongues 57 upon the side and end walls 4 and 5, and it will be observed that the end walls 5 are provided with forwardly projecting triangular portions 58 having flanges 59 to overlie or overlap inwardly extending flanges 60 upon the ends of the side walls 4, thus providing for a complete closure of the body of the carriage in such a way as to house the contained firing mechanism against the access thereto of dust, dirt or other foreign particles. The top wall 6 of the carriage consists of a pair of counter part sections 61 having downturned flanges 62 which overlap the upper edges of the side walls and slits 63 receiving tongues 64 on the side walls whereby the top wall is fastened in position. The sections 61 of the side walls carry the forwardly extending segmental guide plates 7 which are spaced to form a slot or opening 65 through which the nozzle 27 projects and in which said nozzle is adjustable for the purpose of raising and lowering the barrel. This slot is closed at its end portions by short flanges 66 projecting from the plates 7, the flanges of one plate being provided with tongues 67 to engage slits (not shown) in the flanges of the opposite plate, whereby end walls or closures for the slot are provided, which end walls or closures act as stops to limit the swinging movement of the nozzle.

Having thus fully described my invention, I claim:—

1. In a toy centrifugal gun, a mount, a casing disposed therein and having a discharge nozzle projecting through the mount, centrifugal firing mechanism for discharging projectiles through said nozzle, and a barrel having a recessed portion engaging

the casing and detachably interlocking with the nozzle.

2. In a toy centrifugal gun, a mount, a miniature cannon-barrel supported on said mount and projecting beyond one side thereof, a casing disposed within said mount, a discharge nozzle projecting through said mount and connecting the bore of said barrel, and a centrifugal firing mechanism within said casing for discharging projectiles through said nozzle.

3. In a toy centrifugal gun, a mount, a miniature cannon-barrel supported on said mount and projecting beyond one side thereof, and having a recess formed in its under surface, a casing disposed within said mount and projecting into said recess, a discharge nozzle projecting from said casing and connecting the bore of said barrel, and a centrifugal firing mechanism within said casing for discharging projectiles through said nozzle.

4. In a toy centrifugal gun, a mount, a miniature cannon-barrel supported on said mount and projecting beyond one side thereof, and having an elongated recess formed in its under surface, a circular casing disposed within said mount and projecting into said recess, a discharge nozzle projecting from said casing and connecting the bore of said barrel, the inner periphery of said circular casing being formed to provide a trackway for directing the movement of a projectile to said discharge nozzle, and a centrifugal firing mechanism within said casing for discharging projectiles through said nozzle.

5. In a toy centrifugal gun, a mount, a circular casing disposed within said mount, a discharge nozzle projecting from said casing, a miniature cannon-barrel having a recessed portion engaging the casing and a longitudinal bore engaging said discharge nozzle, the inner periphery of said circular casing being formed to provide a trackway for directing the movement of a projectile to said discharge nozzle, a centrifugal firing mechanism within said casing for discharging projectiles through said nozzle, and means for actuating said centrifugal firing mechanism.

6. In a toy centrifugal gun, a mount, a circular casing disposed within said mount, a discharge nozzle projecting from said casing, a miniature cannon-barrel having a recessed portion engaging the casing and a longitudinal bore engaging said discharge nozzle, the inner periphery of said circular casing being formed to provide a trackway for directing the movement of a projectile to said discharge nozzle, a centrifugal firing mechanism within said casing for discharging projectiles through said nozzle, means for supplying projectiles to said centrifugal firing mechanism, and means for actuating said centrifugal firing mechanism.

In testimony whereof, I affix my signature.

JOHN H. PARSONS.