

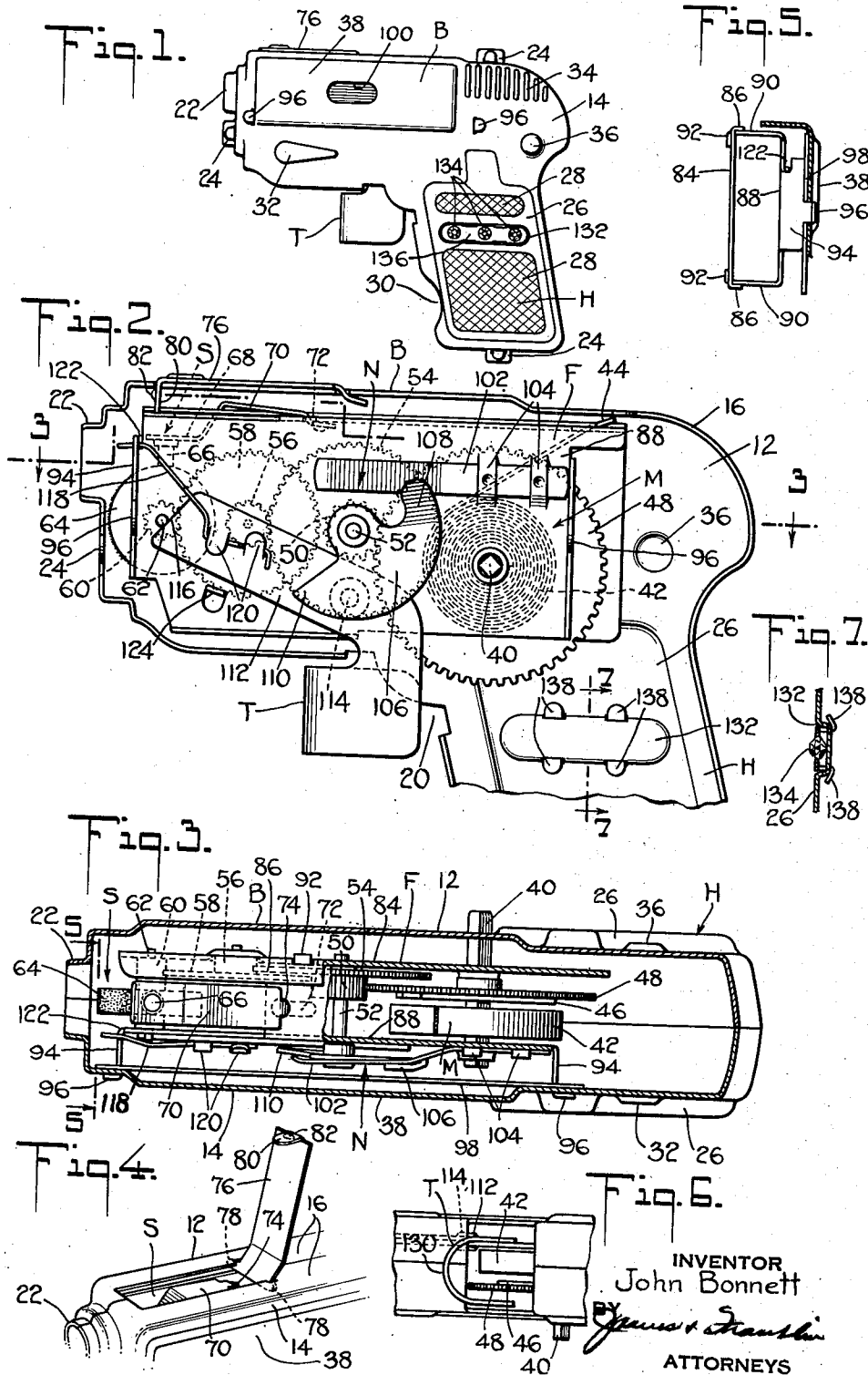
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TOY WEAPON

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TOY WEAPON

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This invention relates to toy weapons, and more particularly to a miniature toy pistol of the automatic type.

One object of my invention is to generally improve toy weapons. More particularly, the object of my invention is to provide a tiny, compact, vest-pocket size toy gun resembling an automatic pistol and having spring motor driven mechanism for producing a loud, rapidly repeated percussive noise and a copious shower of sparks at the muzzle of the pistol, the operation being fully comparable in loudness and realism to that of relatively large toy machine guns and the like.

To the accomplishment of the foregoing general objects and numerous other more detailed objects which will hereinafter appear, my invention consists in the toy pistol elements and their relation one to the other, as are hereinafter more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawing in which:

Fig. 1 is a side elevation of a toy pistol embodying features of my invention;

Fig. 2 shows the same with one half of the two-part casing removed;

Fig. 3 is a horizontal section taken in the plane of the line 3-3 of Fig. 2;

Fig. 4 is a perspective view showing the closure for access to the flint of the sparking mechanism;

Fig. 5 is a transverse section taken in the plane of the line 5-5 of Fig. 3, and is explanatory of the assembly of the motor frame and pistol casing, with the working parts omitted;

Fig. 6 is an inverted plan view explanatory of the trigger mechanism; and

Fig. 7 is a section taken in the plane of the line 7-7 of Fig. 2.

Referring to the drawing, the pistol comprises an outer body or casing having a barrel portion B and a handle portion H. The barrel portion is provided with a motor M, the parts of which are carried by a motor frame F, which substantially fills the entire barrel portion of the gun. The motor is used to drive sparking mechanism generally designated S and noise-making mechanism generally designated N. The motor is started and stopped by suitable trigger mechanism T.

Considering the arrangement in greater detail, the complete casing of the pistol is formed of two main parts or sides 12 and 14, these sides being dish or flanged toward one another and brought into abutting or edge to edge relation

to form both the barrel and handle portions of the casing. The inturned flanges 16 of the side walls are continuous except for an interruption to form a trigger opening 20 (Fig. 2). At the forward end of the gun the flanges are turned outwardly in cylindrical configuration to form a muzzle opening 22. The halves of the casing are held together by suitable tongue and slot connections 24 best shown in Fig. 1, in which they have been exaggerated in dimension for clarity. The sides of the casing walls are pressed outwardly at 26 and scored at 28 to form a thickened handle of improved appearance, and the forward edge of the handle is indented at 30 to receive the middle finger of the operator, the trigger finger, of course, being placed in front of the trigger T. Additional projections 32, 34, and 36 are formed on the side walls of the barrel portion in order to improve the realistic appearance of the toy, and a large rectangular area is displaced outwardly at 38 to increase the noise produced by the toy, as will be explained subsequently.

The motor M is a spring motor, and includes a suitable preferably square winding stem 40 connected to the inner end of a suitable spiral ribbon spring 42, the outer end of the spring being connected to the frame F at 44. The outer or projecting end of this winding stem is adapted to receive a winding key, the latter being so constructed that the stem needs to project from the pistol body by only a slight amount. Winding stem 40 is connected through suitable ratchet mechanism 46 with a main driving gear 48. This gear meshes with a pinion 50 mounted on a shaft 52 and fixed to a gear 54 meshing with a pinion 56 secured to a gear 58 meshing with a pinion 60 mounted on a spindle 62. The spindle 62 is thus rotated at high speed at the end of the step-up gear train. This spindle carries an abrasive wheel 64 mounted immediately adjacent the muzzle opening 22, the top of the wheel 64 being aligned with the center of muzzle opening 22, as will be apparent from inspection of Fig. 2.

The sparking mechanism S is completed by a pyrophoric element 66 which, for convenience, will be referred to as a flint. Flint 66 is fixed at its upper end in the forward or freely movable end 68 of a suitable arm 70 formed of sheet metal. The rear end of arm 70 is reduced to form a tongue 72 which is loosely received in a hole 74 (Fig. 3) at the top of the motor frame F. The entire top wall of the motor frame is cut away ahead of the opening 74, so that the arm 70 is freely movable, and in practice it bounces around

freely in a loose and self-adjustable manner which greatly prolongs the operating life of the flint. This construction also makes it possible to produce an abrasive wheel 64 in an inexpensive manner, for it may be relatively coarse and inaccurate without damaging the flint.

The inturned flanges 16 of the casing are cut away above the flint arm 70 for access to the flint, as is shown in Fig. 4. It will be understood that the flint arm and flint are readily removed by picking the same upwardly or by inverting the gun. Complete escape of the arm 70 during operation of the gun is prevented by a suitable closure 76. As will be seen in Fig. 4, the rear end of closure 76 is provided with outwardly projecting ears 78 which are anchored beneath the flanges 16 of the casing and which operate as a hinge for the closure. The forward end of the closure is bent downwardly at 80 and provided with a detent projection 82 which is received beneath the forward edge of the opening with a snap engagement when the closure is closed. It will be understood from inspection of Fig. 2, that the closure 76 is located a substantial distance above the flint arm 70 in order not to interfere with the desired free movement of the flint arm during operation of the gun.

To understand the relatively compact and simplified nature of the noise-making mechanism N it may be helpful to first describe the construction of frame F. The frame is formed of two pieces of sheet metal, a side 84 the top and bottom edges of which are flanged at 86, and an opposite side 88, the top and bottom edges of which are folded to form the top and bottom walls or spacer walls 90 of the frame. These walls are provided with tongues 92 which pass through mating slots in side wall 84, as is best shown in Fig. 5. The forward and rear ends of the side wall 88 are turned outwardly to form vertically disposed spacer strips 94. These are each provided with a motor support tongue 96. A relatively large area diaphragm 98 made of thin fibre board or the like is disposed alongside of the motor frame and is provided with slots through which tongues 96 pass. These tongues then pass through mating slots in the side of the casing and are turned outwardly, as is best shown in Figs. 1 and 3. The motor frame is thus mounted on the side 14 of the casing and is kept in spaced relation therefrom by the spacers 94. At the same time, the resonant sounding diaphragm 98 is mounted in place. This diaphragm is spaced from the side wall of the pistol casing because of the outward displacement of the relatively large rectangular area 38 previously referred to. The said area 38 is preferably provided with a sound discharge window 100, thus affording ready egress of sound produced when diaphragm 98 is struck.

The diaphragm is struck by a leaf spring hammer 102 best shown in Fig. 2. One end of this spring is secured to the side 88 of the motor frame by means of straps 104 formed by displacing parts of the frame outwardly. The other end of the leaf spring is free, and the spring is so shaped that the free end tends normally to move outwardly against diaphragm 98.

The spring is forced inwardly and released by a suitable cam 106. This cam is a helical face cam of relatively large radius, but the operation is such that the spring hammer 102 may be disposed near the axis of the cam. The cam is mounted on the outer end of intermediate motor shaft 52 previously referred to. This shaft 75 is projected through the frame wall 88, and the

cam is mounted on this outer end, as is best shown in Fig. 3. The leading end 108 of the cam is displaced outwardly an amount sufficient to come outside the sloping or biased intermediate portion of spring hammer 102. The parts are then in the position shown in Figs. 2 and 3. Continued rotation of the cam forces the spring 102 inwardly, that is, toward the motor frame, this being due to the helical nature of the cam. The spring is held inwardly until the trailing edge 110 of the cam reaches and passes the spring 102. A large part of the cam is cut away, that is, the cam has substantially less than one convolution, and as here illustrated, is approximately only semi-circular. When the trailing edge 110 leaves the spring, the spring is therefore free to move outwardly to strike the diaphragm 98. Because of its large area and freedom for vibration, this diaphragm produces an amplified percussive sound. As the cam rotates, the percussive sound is repeated in rapid succession, so long as the motor is allowed to run.

The entire noise-making mechanism is so compact and advantageously related to the motor that the over-all dimension of the pistol is not increased.

The trigger mechanism T comprises a single piece of sheet metal 112 (Fig. 2), located on the outside of frame wall 88 and pivotally related thereto by means of a suitable eyelet 114. The lower end of member 112 acts as the trigger, and the upper end includes a biased or cam-like brake surface 116 which is disposed immediately adjacent the outwardly projecting end of one of the motor shafts, preferably the spindle 62. The brake member is normally urged upwardly by a suitable wire spring 118, one end of which is anchored on member 112 by oppositely facing tongues 120 (Figs. 2 and 3), and the other end of which is received in a slot 122 (Figs. 3 and 5) cut at the upper end of the forward spacer wall 94. Spring 118 normally pulls the brake surface 116 into a tight wedging engagement with the spindle 62. Inasmuch as this is a specially high speed spindle, it is readily stopped by the brake member, thus stopping the operation of the entire motor. To start the motor, it is simply necessary to draw the trigger backwardly, thus moving the brake surface 116 downwardly away from spindle 62. This downward movement may be arrested by a stop lug 124 formed on the motor frame wall 88.

The sheet metal member below pivot 114 is reversely bent to U-shaped section, best shown at 130 in Fig. 6. This presents a broad, smooth surface to the trigger finger even though the trigger and brake member are formed integrally of a single piece of sheet metal. The closed part of the U faces forwardly, and the sides of the U fit within the sides of the case at the trigger opening 20. The arrangement is advantageous because the brake member 112 may be located at one side of the motor frame, yet the trigger is centrally or symmetrically located with respect to the pistol. A further advantage arises because of the exceedingly compact nature of the present structure. The driving spring is shown in Figs. 2 and 3 in its closed or closely coiled condition. It should be understood, however, that when the spring is unwound it expands to a dimension 70 greater than that of the main driving gear 48. Free expansion of the spring increases the operating time of the motor for a single winding. With the trigger construction here shown, the spring may expand until the outermost convolu-

tions come through the trigger opening 20 and are received within the hollow or open trigger section, as is best shown in Fig. 6.

The pistol casing may, if desired, be ornamented by imitation jewels. For this purpose the side of the handle is indented at 132. Imitation jewels 134 are spaced apart and held in place by a cover plate 136. This cover plate is provided with tongues 138 which are received through slots at the top and bottom of the indented portion 132, as is best shown in Fig. 2. Because of the substantial indentation at the area 132, the cover plate comes substantially flush with the side wall of the handle, and the jewels appear to be set directly into the handle.

It is believed that the construction and operation, as well as the many advantages of my improved toy pistol, will be apparent from the foregoing detailed description thereof. The pistol is exceedingly tiny and compact, yet possesses a sturdy, realistic appearance. The operation is surprisingly realistic because of the loud rapidly repeated percussive sound produced, and because of the full and copious discharge of sparks produced immediately at the muzzle end of the gun.

It will be apparent that while I have shown and described my invention in a preferred form, many changes and modifications may be made in the structure disclosed, without departing from the spirit of the invention defined in the following claims.

I claim:

1. A toy pistol comprising a small compact pistol body having barrel and handle portions, a spring motor occupying substantially all of said barrel portion and including a train of step-up gearing leading to a spark-producing abrasive wheel at the muzzle of the gun, the shafts of said gear train extending transversely of the pistol barrel, and noise-making mechanism disposed compactly alongside said motor in said barrel portion, said mechanism including a sheet fibre noise-producing diaphragm extending generally parallel to and between the side of the spring motor and the side of the barrel portion of the pistol, and means operated by said motor for repeatedly striking said diaphragm, said means including a cam mounted on one of said shafts.

2. A toy pistol comprising a small compact pistol body, a spring motor arranged therein, and noise-making mechanism compactly arranged alongside the motor, said mechanism including a relatively large-diameter helical face cam mounted on the outer end of a shaft of the motor, a hammer having one end secured to the side of said motor and having its other end disposed behind the aforesaid cam, and a noise-producing diaphragm extending generally parallel to and closely adjacent the frame of the spring motor outside the cam, said hammer being movable in one position of the cam to strike the diaphragm.

3. A toy pistol comprising a small compact pistol body having barrel and handle portions, a spring motor arranged in said barrel portion, and noise-making mechanism compactly arranged alongside the motor, said mechanism including a relatively large-diameter helical face cam having a periphery of only a half convolution, said cam being mounted on the outer end of a shaft of the aforesaid motor, a leaf spring hammer having one end secured to the frame of said spring motor and having another portion so disposed as to come behind the aforesaid cam during revolution of the cam, said leaf spring passing near the cam shaft and extending beyond said

shaft, and a sheet fibre noise-producing diaphragm extending generally parallel to the side of the spring motor between the cam and the side of the barrel portion of the pistol.

4. A toy pistol comprising a small compact pistol body having barrel and handle portions, a spring motor arranged in and occupying substantially all of the length of said barrel portion and including a train of step-up gearing leading to a spark-producing abrasive wheel at the muzzle of the gun, and noise-making mechanism compactly arranged alongside the motor, said mechanism including a relatively large-diameter helical face cam mounted on the outer end of an intermediate shaft of the aforesaid step-up gear train, a leaf spring hammer having one end secured to the frame of said spring motor and having its other end so disposed as to come behind the aforesaid cam, during rotation of the cam, and a sheet fibre noise-producing diaphragm extending generally parallel to and closely adjacent the side of the spring motor between the cam and the side of the barrel portion of the pistol.

5. A toy pistol having a small compact casing, a spring motor frame comprising spaced parallel sheet metal side walls disposed in the casing and occupying nearly the whole length thereof, a spring and train of step-up gearing disposed within said spring motor frame, the ends of the frame at one side being bent sidewardly to form spacer members, an extensive sound-producing diaphragm arranged collateral to the side of the motor frame and spaced therefrom by the aforesaid spacer members, the side wall of the pistol casing being spaced from said diaphragm, a cam mounted on one of the motor shafts, and a hammer movable by said cam to strike the aforesaid diaphragm.

6. A toy pistol having a small compact casing, a spring motor frame comprising spaced parallel sheet metal side walls disposed in the casing, a spring and train of step-up gearing disposed within said spring motor frame, the ends of the frame at one side being bent sidewardly to form spacer members and tongues passing through mating slots in the side of the pistol casing, an extensive fibre sound-producing diaphragm arranged parallel to the side of the motor frame and spaced therefrom by the aforesaid spacer members, the side wall of the pistol casing within said tongues being displaced outwardly at said diaphragm and having a sound discharge opening, a cam mounted on one of the motor shafts, and a hammer movable by said cam to strike the aforesaid diaphragm.

7. A small compact toy pistol having barrel and handle portions resembling an automatic pistol, a spring motor frame comprising spaced parallel sheet metal side walls disposed in and occupying substantially all of the length of the barrel portion of the pistol, a spring and train of step-up gearing and sparking mechanism disposed within said spring motor frame, the ends of the frame at one side being bent sidewardly to form spacer members and tongues passing through mating slots in the side of the pistol barrel, an extensive fibre sound-producing diaphragm arranged collateral to the side of the motor frame and spaced therefrom by the aforesaid spacer members, the side wall of the pistol barrel being displaced outwardly at said diaphragm and having a sound discharge opening, a helical face cam mounted on one of the motor shafts between the diaphragm and the motor frame, and a leaf spring hammer having one end fixedly secured to the motor frame

and having its other end disposed between the cam and the motor frame but movable when released by said cam to strike the aforesaid diaphragm outside the cam.

8. A toy pistol comprising barrel and handle portions, a spring motor disposed in the barrel portion and including a train of step-up gearing leading to a high speed shaft, and trigger mechanism for controlling the operation of the pistol, said trigger mechanism including a single piece of sheet metal pivoted at one side of the motor and having a depending portion bent to trigger shape and a forwardly extending portion having a brake end disposed immediately adjacent the high speed shaft, and resilient means normally moving the trigger to forward position and the brake end into braking engagement with the shaft.

9. A toy pistol comprising barrel and handle portions, a spring motor disposed in the barrel portion and including a train of step-up gearing leading to a spark-producing abrasive wheel at the muzzle end of the motor, noise-making mechanism disposed at the side of the motor between the motor and the side of the barrel, and trigger mechanism for controlling the operation of the pistol, said trigger mechanism including a single piece of sheet metal pivoted at one side of the motor and having a depending portion bent to trigger shape and a forwardly extending portion having a brake end disposed immediately adjacent the outwardly projecting end of the shaft of the aforesaid abrasive wheel, and resilient means normally moving the trigger to forward position and the brake end into braking engagement with the shaft.

10. A toy pistol of small dimension, including a spring motor with a driving spring, and a trigger for controlling the operation of said spring motor, said trigger being formed of sheet metal bent to U-shaped section, with the open part of the U directed rearwardly, the arrangement being such that the spring when fully unwound may expand until its outermost convolutions are received within the open portion of the aforesaid trigger member.

11. A toy pistol of small dimension having barrel and handle portions resembling a pistol of the automatic type, said pistol including a spring motor arranged in the barrel of the pistol with the driving spring at the rear end thereof, sparking and noise-making mechanisms driven by said spring motor, and a trigger for controlling the operation of said spring motor, said trigger being formed of sheet metal bent to U-shaped section, with the open part of the U directed rearwardly and disposed at the junction of the handle and barrel portions of the pistol, the arrangement being such that the spring when fully unwound may expand until its outermost convolutions are received within the open rear portion of the aforesaid trigger member.

12. A toy pistol comprising barrel and handle portions, a spring motor disposed in the barrel portion and including a train of step-up gearing leading to a high speed shaft, and trigger mechanism for controlling the operation of the pistol, said trigger mechanism including a single piece of sheet metal pivoted at one side of the motor and having a depending portion bent to U-shape and a forwardly extending portion having a brake end disposed immediately adjacent the high speed shaft, and resilient means normally moving the brake end into braking engagement with the shaft, the trigger being so disposed that

the driving spring of the spring motor may expand until its outermost convolutions are received within the open portion of the trigger.

13. A toy pistol comprising barrel and handle portions, a spring motor disposed in the barrel portion and including a train of step-up gearing leading to a high-speed shaft, and trigger mechanism for controlling the operation of the pistol, said trigger mechanism including a single piece of sheet metal pivoted at one side of the motor and having a depending portion bent to trigger shape and a forwardly extending portion having a brake end disposed immediately adjacent the high-speed shaft, and resilient means connected at one end to the brake end of the trigger mechanism and anchored at its other end on the frame of the motor, said resilient means functioning to move the trigger to forward position and the brake end into braking engagement with the shaft.

14. A toy piston comprising a casing made of flanged or dished halves held together in edge to edge relation by appropriate tongue and slot connections, a spring motor frame comprising spaced parallel sheet metal side walls disposed in the casing, the top and bottom edges of one of said walls being bent sidewardly toward the other wall and secured thereto with tongue and slot connections, the end edges of one of the walls being bent sidewardly away from the opposite wall to form spacer members which bear against the adjacent casing wall, and to form tongues which pass through the casing wall and are bent to anchor the motor frame to said casing wall, an extensive sound-producing diaphragm arranged parallel to the side of the motor frame and disposed between the spacer members and the casing wall, a part of said casing wall being displaced outwardly at said diaphragm and having a sound discharge opening, a leaf spring secured at one end to the frame wall and normally moving at its other end into engagement with the diaphragm, a cam for moving the spring away from the diaphragm and then releasing the same to strike the diaphragm, said cam being driven by spring motor mechanism in the aforesaid frame.

15. A toy pistol comprising a relatively small compact pistol body having a barrel and handle portions, sparking mechanism at the muzzle of said pistol body, said sparking mechanism including an abrasive wheel and a pyrophoric element resting loosely thereagainst, means to rotate said abrasive wheel at high speed, said means including a driving spring and a train of step-up gearing leading from the driving spring to the abrasive wheel, said spring and step-up gearing occupying nearly the entire barrel portion of the pistol, and noise-making mechanism driven by the same spring motor and so arranged as not to necessitate any increase in the major dimensions of the pistol body, said noise-making mechanism comprising a noise-producing diaphragm extending generally parallel to and closely adjacent the side of the pistol body, a leaf spring hammer extending collaterally of the diaphragm, and a helical face cam mounted at one end of one of the shafts in the aforesaid train of step-up gearing, said cam being so shaped as to move the movable end of the leaf spring inwardly and to then release the same, said cam being disposed intermediate the fixed and movable ends of the leaf spring, and the axis of said cam being disposed sidewardly of the leaf spring.

16. A toy sparking pistol comprising a pistol-shaped casing made of flanged or dished halves of

sheet metal secured together in edge to edge relation by appropriate tongue and slot connections, a rotatable abrasive wheel in said pistol body near the muzzle thereof, a motor for driving said abrasive wheel, a pyrophoric element disposed over the abrasive wheel for causing a shower of sparks to be discharged at the muzzle of the gun, and an opening with an openable closure therefor disposed over the pyrophoric element for access thereto, the adjacent edges of the halves of the casing being cut away to form the opening and being

further outwardly notched at one end of said opening, the closure having outwardly projecting lugs at one end thereof, said lugs being disposed inside the casing at the aforesaid notches, whereby the closure is pivotally mounted on the casing, the forward end of said closure being bent downwardly and provided with an outwardly struck detent adapted to hold the closure in closed position.

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