

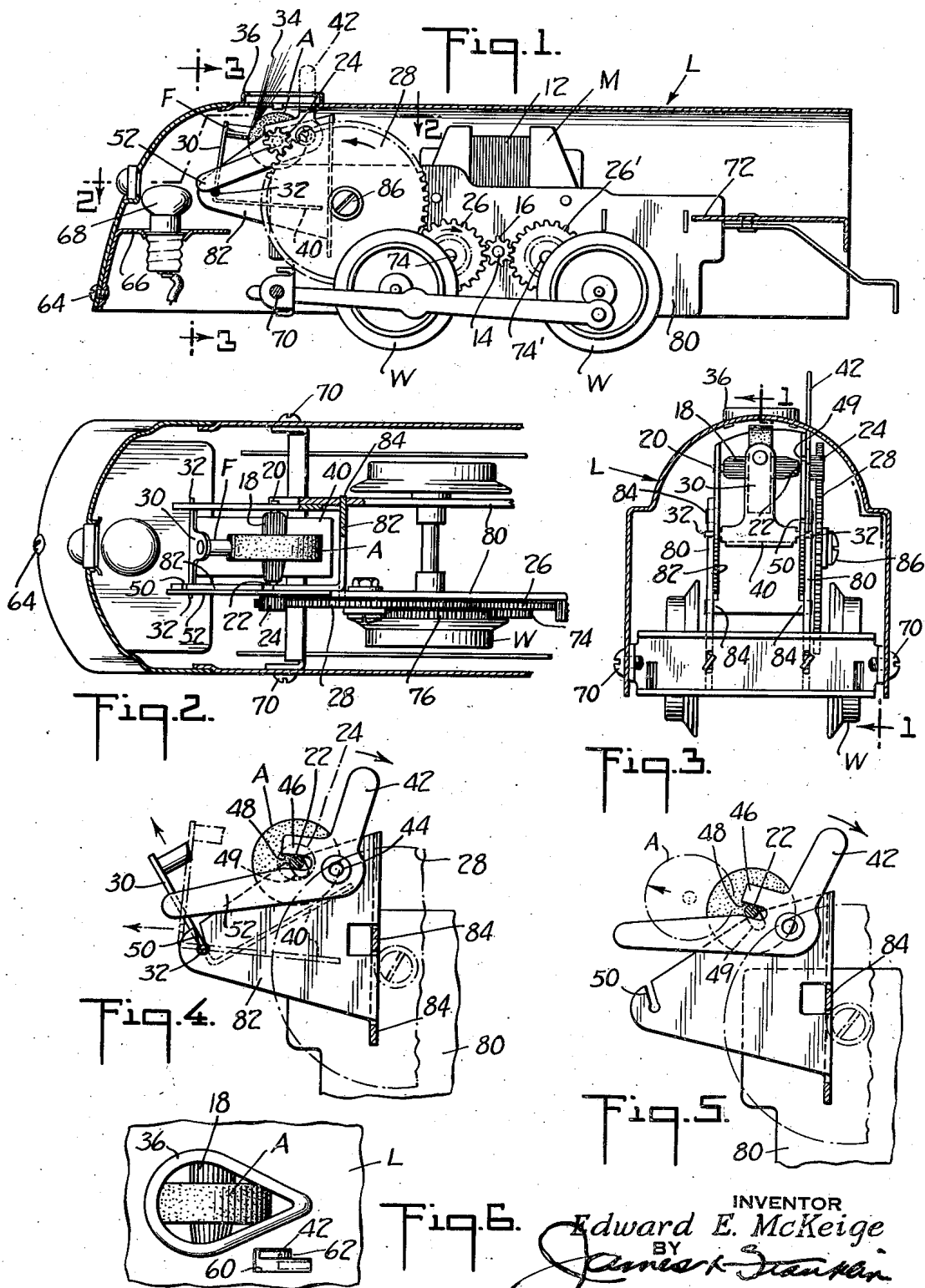
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SPARKING TOY

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## SPARKING TOY

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This invention relates to sparking toys, more particularly sparking vehicle toys, and especially railroad locomotive toys.

The primary object of my invention is to generally improve sparking toys, and, more especially, sparking vehicle toys. A more particular object is to provide such a toy with means making the sparking mechanism operative or inoperative at will. Another object is to so mount the holder of the pyrophoric element (which element for brevity may be called a flint) as to make the holder readily removable and replaceable when the element is worn out. Still another object is to so mount the abrasive wheel which rubs against the flint that it too may be removed and replaced when desired. Still another object is to so mount both the holder and the abrasive wheel as to make the same freely movable with a minimum of friction, yet to effectively prevent accidental escape from their respective mountings as long as the mechanism of the toy is mounted within the body or shell of the toy. Upon removal of the body from the mechanism, however, a part, the motion of which was theretofore limited by the body, becomes readily movable to a position releasing the flint holder or/and abrasive wheel. In accordance with still another object and feature of my invention, and with a view to further simplifying the mechanism of the toy, a single control element is used for three purposes, first to make the sparking mechanism operative or inoperative, second to control the release of the flint holder for replacement, and third to control the release of the abrasive wheel for replacement.

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

Fig. 1 is a partially sectioned side elevation of a locomotive toy embodying my invention;

Fig. 2 is a horizontal section taken in the plane of the line 2—2 of Fig. 1;

Fig. 3 is a transverse section taken in the plane of the line 3—3 of Fig. 1;

Fig. 4 is an enlarged detail explanatory of the control mechanism of the invention;

Fig. 5 is a similar view, but showing the control mechanism in another position; and

Fig. 6 is a plan view of a portion of the top

of the locomotive explanatory of the detent slot for the control lever.

Referring to the drawing, the toy there shown comprises a motor generally designated M and sparking mechanism including an abrasive wheel A and a flint F. The motor M may be used to drive toy operations other than the production of sparks, and, in the present case, the motor functions primarily as the driving motor for the wheels W of a simulated steam locomotive L.

Considering the arrangement in greater detail, the motor M is here illustrated as an electric motor of conventional type, having a field coil 12 and an armature shaft 14 bearing a motor pinion 16. The motor is energized in the usual way, through a third rail and a contact shoe, not shown in the drawing.

The abrasive wheel A may, in inexpensive form, be made of wood having particles of abrasive material cemented to the periphery thereof by a suitable adhesive. The wheel A is driven onto an elongated pinion shaft 18 parts of the pinion teeth of which are turned away, as indicated at 20 and 22 in Figs. 2 and 3. At the end 24, the pinion teeth function as part of the gear train driving the abrasive wheel.

In the present case, the gear train includes motor pinion 16 driving an intermediate gear 26 with which meshes a large gear 28 which in turn engages the pinion 24.

The element F is preferably a pyrophoric element of known type, and it is merely for brevity and convenience that I refer to the same as a flint. The flint is secured at the upper end of a flint-holding arm 30 the lower end of which is pivotally mounted at 32. The flint holder 30 is so disposed with relation to the abrasive wheel as to throw a shower of sparks upwardly, as indicated at 34, this being desirable in the present case where the sparks are simulatedly ejected through the smoke-stack 36 of the locomotive L. The flint is preferably held against the abrasive wheel by a light gravitational pressure, this being desirable in order to permit the flint to move around freely and self-adjustably, thereby minimizing wear of the flint and the abrasive wheel. Such a construction also makes it possible to use a relatively cheap, rough-surfaced abrasive wheel instead of a precision element. To this end, a weight arm 40 is provided extending in a generally horizontal direction, this arm being connected to the flint holder 30, and, in the present case, being formed integrally therewith out of a single piece of sheet metal. The sheet metal arm is itself adequate in weight to hold the flint

against the abrasive wheel, although it may, of course, be loaded with additional weight if desired.

In accordance with one of the features of the present invention, the sparking mechanism may be made operative or inoperative at will. This is done by disconnecting the abrasive wheel from the motor M, and, more specifically, by shifting the pinion 24 out of mesh with the gear 28. The operation of the sparking mechanism is controlled by lever 42, clearly shown in Figs. 1 and 3 of the drawing. The manner in which this lever functions may be explained with reference to Fig. 4 of the drawing. Lever 42 is pivotally mounted on an eyelet 44 and a sideward extension or angle lever 46 is slotted at 48 to receive the journal 22 of the abrasive wheel. This journal is also received in a slotted bearing 49. It will be evident, from inspection of Fig. 4, that with the lever 42 moved to the position shown, the pinion 24 of the abrasive wheel has been moved out of mesh with the gear wheel 28, and, conversely, that by moving control lever 42 in a counterclockwise direction to the position shown in Fig. 1, the pinion 24 is moved into mesh with gear 28.

The flint holder 30 is removable for replacement. The trunnions or ears 32 formed integral with the flint holder are carried in bearings one of which is a hole and the other of which is an open-ended slot 50, best shown in Figs. 4 and 5. Slot 50 is normally closed by arm 52 which assumes the position shown in Fig. 1. When the arm is elevated, as shown in Figs. 4 and 5, it is possible to tilt the flint holder until one of the lugs 32 is lifted out of slot 50, whereupon the other is readily pulled sidewardly out of the bearing hole receiving the same. The new flint holder is replaced by the reverse operation.

The abrasive wheel A is also preferably removably mounted in position so that it can be replaced when worn out. Specifically, the end journal 20 is received in a bearing hole while the journal 22 is received in the slot 49 which, like slot 50, is an open-ended slot. Journal 22 is normally held against escape from slot 49 by the yoke 46 encompassing the same. If, however, the yoke 46 is moved in a clockwise direction a sufficient distance, as shown in Fig. 5, the journal 22 is freed for movement out of slot 49 and also out of slot 48. The opposite end journal 20 may then be pulled axially out of its bearing hole, and the wheel and shaft thus removed for replacement.

It may be explained that the parts are so proportioned that accidental escape of either the flint holder or the abrasive wheel is impossible, and this is true despite the fact that the mechanism of the toy has been simplified by making a single lever 42 function for three purposes; first, the spark control; second, the removal of the flint holder; and third, the removal of the abrasive wheel. The lever 42 projects through a slot 60 in the top of the toy. This slot limits the movement of lever 42 to a slight amount just sufficient to produce engagement or disengagement of the gears 24 and 28. The accompanying movement of arm 52 is insufficient to clear the bearing slots 50 and 49. In other words, the maximum movement of arm 42 permitted by the toy body is less than that indicated in Fig. 4. Incidentally, the slot 60 may be stepped, as shown at 62 in Fig. 6, thus operating as a detent to hold the lever 42 in the forward position, at which time the gears are in mesh. Lever 42 is

so shaped that it normally moves toward the stepped side of the slot, and the gears are thus held in mesh despite any natural tendency for them to separate because of the pressure at the gear teeth.

Because of the limited movement of arm 42, it is impossible for either the flint holder or the abrasive wheel to escape from their respective bearings. Of course, it is also impossible to intentionally remove the same, but this would anyway be very difficult, if not altogether impossible, because of the closely surrounding toy body. Consequently, to replace these parts, it is necessary to first remove the toy body from around the mechanism. In the present case, this may be done by removing the screw 64 to release the holder 66 of lamp 68, and by then removing the side screws 70. This releases the front end of the motor truck, and the rear end is then removable because it is held merely by slots in the motor frame receiving the forward edge 72 of a plate forming a part of the toy body.

When the toy body has been removed, the lever 42 may be swung clockwise as far as desired and to the extreme position shown in Fig. 5, at which time either flint holder or the abrasive wheel, or both, may be replaced. In a broad sense, these parts are held against accidental escape by an arm, the movement of which is limited by the toy body but which arm is readily moved as far as necessary when the toy body has been removed.

The specific toy here illustrated simulates a railroad locomotive. The wheels W are, therefore, flanged wheels of conventional type, and they are driven from motor pinion 16 by a conventional gear train, in this case including the pinion 16 driving the gears 26, 26', which, in turn, have secured thereto and drive gears 74, 74', which, in turn, mesh with gears 76, 76' formed directly on the wheels W.

The motor truck frame 80 may be of substantially conventional type, for the parts of the sparking mechanism are all mounted in a sub-frame 82 secured between the side plates of frame 80 by tongues 84 received in mating slots in the side plates. The large gear 28 is mounted on the outside of frame 80 by means of a screw bearing 86. With this construction, a locomotive toy may be modified from one without the sparking mechanism to one with the sparking mechanism by simply providing the necessary slots in frame 80 to receive the sub-frame 82; by providing a threaded hole in frame 80 to receive the bearing 86; and by slotting the top of the locomotive body to form the slot 60 through which control lever 42 passes. In this way, the manufacturer can market the top in both forms with a minimum of expense for tools and dies.

The control lever 42 for controlling the operation of the spark producing mechanism is very convenient not only to make the mechanism optionally usable, but also because of the desirability of disconnecting the gearing when the locomotive is to be run for any appreciable time in a reverse direction, for, at such time, the sparks generated are thrown downward and, therefore, are not visible.

It is believed that the construction, operation, and many advantages of my improved sparking mechanism for toys will be apparent from the foregoing detailed description thereof. It will also be apparent that, while I have shown and described my invention in a preferred form, many changes and modifications may be made in the

structures disclosed without departing from the spirit of the invention defined in the following claims.

I claim:

1. A toy vehicle comprising a body having an opening, a motor truck, wheels thereon, a motor therein, gearing connecting said motor and wheels, and spark-producing mechanism disposed at the opening, including an abrasive wheel, a flint and flint holder movably mounted with the flint resting on the abrasive wheel in such position as to direct sparks near the opening, gearing connecting the motor and the abrasive wheel, a gear shift lever for moving the gear of the abrasive wheel into or out of mesh with a gear driving the same, in order to make the sparking mechanism operative or inoperative, the aforesaid toy body being slotted to receive said lever, said lever projecting through said slot and said slot being stepped to define the operative and inoperative positions of the lever.
2. A toy comprising a motor frame, a motor therein, an abrasive wheel, gearing between said motor and said abrasive wheel, a flint and flint holder pivotally mounted on said frame and bearing against said abrasive wheel, an arm associated with said flint holder and movable to a position such that the flint holder may be removed from the frame, a toy body on said frame, said body limiting the movement of said arm to prevent accidental escape of the flint holder, said frame being bodily removable from said body at which time said arm is movable to a greater extent affording release of the flint holder.
3. A toy comprising a motor frame, a motor therein, an abrasive wheel, gearing between said motor and said abrasive wheel, a flint and flint holder pivotally mounted on said frame and bearing against said abrasive wheel, an arm associated with said abrasive wheel and movable to a position such that the abrasive wheel may be removed from the frame, a toy body on said frame, said body limiting the movement of said arm to prevent accidental escape of the flint holder, said frame being removable from said body at which time said arm is movable to a greater extent affording release of the abrasive wheel.
4. A vehicle toy comprising a motor truck, a motor therein, wheels thereon, gearing between said motor and wheels, an abrasive wheel, gearing between said motor and said abrasive wheel, a flint and flint holder pivotally mounted on said truck and bearing against said abrasive wheel, an arm associated with said flint holder and movable to a position such that the flint holder may be removed from the truck, a toy body on said truck, said body limiting the movement of said arm to prevent accidental escape of the flint holder, but said truck being bodily removable from said body at which time said arm is movable to a greater extent affording release of the flint holder from the truck.
5. A vehicle toy comprising a truck, a motor therein, wheels thereon, gearing between said motor and wheels, an abrasive wheel, gearing between said motor and abrasive wheel, a flint and flint holder pivotally mounted on said truck in a bearing slot, a lever functioning to close the aforesaid bearing slot whereby said flint is normally held against escape from said slot but may be removed therefrom by first swinging said lever to clear the slot.
6. A vehicle toy comprising a motor, toy means driven thereby, gearing between said motor and

means, an abrasive wheel, gearing between said motor and abrasive wheel, a flint and flint holder pivotally mounted on said truck in a bearing slot, a gear shift lever for moving a gear into or out of mesh with a gear driving the same in order to make the sparking mechanism operative or inoperative, a part of said lever functioning to close the aforesaid bearing slot whereby said flint is normally held against escape from said slot but may be removed therefrom by first swinging said gear shift lever to clear the slot.

7. A toy vehicle comprising a truck, a motor therein, wheels thereon, gearing between said motor and wheels, an abrasive wheel, gearing between said motor and abrasive wheel, a flint and flint holder pivotally mounted on said truck in bearing slots, a gear shift lever for moving a gear into or out of mesh with the gear driving the same in order to make the sparking mechanism operative or inoperative, a part of said lever functioning to close the aforesaid bearing slots whereby said flint is normally held against escape from said slots but may be removed therefrom by first swinging said gear shift lever to clear the slots.

8. A vehicle toy comprising a truck, a motor therein, wheels thereon, gearing between said motor and wheels, an abrasive wheel, an open-ended bearing slot receiving said abrasive wheel, gearing between said motor and abrasive wheel, a flint and flint holder, a lever functioning to close the aforesaid bearing slot, whereby said abrasive wheel is normally held against escape from said slot but may be removed therefrom by first swinging said lever to clear the slot.

9. A vehicle toy comprising a truck, a motor therein, wheels thereon, gearing between said motor and wheels, an abrasive wheel, an open-ended bearing slot receiving said abrasive wheel, gearing between said motor and abrasive wheel, a flint and flint holder, a gear shift lever for moving a gear into or out of mesh with the gear driving the same in order to make the sparking mechanism operative or inoperative, a part of said lever functioning to close the aforesaid bearing slot, whereby said abrasive wheel is normally held against escape from said slot but may be removed therefrom by first swinging said gear shift lever to clear the slot.

10. A vehicle toy comprising a truck, a motor therein, wheels thereon, gearing between said motor and wheels, an abrasive wheel, an open-ended bearing slot receiving said abrasive wheel, gearing between said motor and abrasive wheel, a flint and flint holder pivotally mounted on said truck in another bearing slot, and a lever functioning to close the aforesaid bearing slots, whereby said flint and abrasive wheel are normally held against movement out of said slots but both may be removed therefrom by first swinging said lever to clear the slots.

11. A vehicle toy comprising a truck, a motor therein, wheels thereon, gearing between said motor and wheels, an abrasive wheel, an open-ended bearing slot receiving said abrasive wheel, gearing between said motor and abrasive wheel, a flint and flint holder pivotally mounted on said truck in another bearing slot, a gear shift lever for moving a gear into or out of mesh with the gear driving the same in order to make the sparking mechanism operative or inoperative, a part of said lever functioning to close the aforesaid bearing slots, whereby said flint and abrasive wheel are normally held against escape from said slots but may be removed therefrom by first

swinging said gear shift lever to clear the slots.

12. A toy comprising a toy body, a truck, a motor therein, wheels thereon, gearing interconnecting said motor and wheels, and sparking mechanism for ejecting a shower of sparks from the toy, said sparking mechanism being carried in a sub-frame secured within the forward part of the motor truck frame by tongue and slot connections, said sub-frame carrying an abrasive wheel and a pinion secured thereto, a flint and flint holder, and a gear shift lever for moving said abrasive wheel and its pinion, and gearing connecting the motor and the aforesaid gearing to the pinion, said gear shift lever projecting through a slot in said body, and said slot being stepped to define positions of said lever which move said pinion into or out of engagement with the gearing.

13. A toy comprising a truck, a motor therein, wheels thereon, gearing interconnecting said motor and wheels, and sparking mechanism for ejecting a shower of sparks from the toy, said sparking mechanism being carried in a sub-frame secured within the forward part of the motor

truck frame by tongue and slot connections, said sub-frame carrying an abrasive wheel and a pinion secured thereto, a flint and flint holder, and a lever for releasably anchoring the abrasive wheel and the flint holder in the sub-frame, and gearing connecting the motor and the aforesaid gearing to the pinion.

14. A locomotive toy comprising a truck, a motor therein, wheels thereon, gearing interconnecting said motor and wheels, and sparking mechanism for ejecting a shower of sparks from the chimney of the locomotive, said sparking mechanism being carried in a sub-frame secured within the forward part of the motor truck frame by tongue and slot connections, said sub-frame carrying an abrasive wheel and a pinion secured thereto, a flint and flint holder, and a gear shift lever for moving said abrasive wheel and its pinion and for releasably anchoring the abrasive wheel and the flint holder in the sub-frame, and gearing connecting the motor and the aforesaid gearing to the pinion.

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