Jan. 4, 1938. G. EINFALT 2,104,510

TOY RAILWAY

Filed Jan. 25, 1937

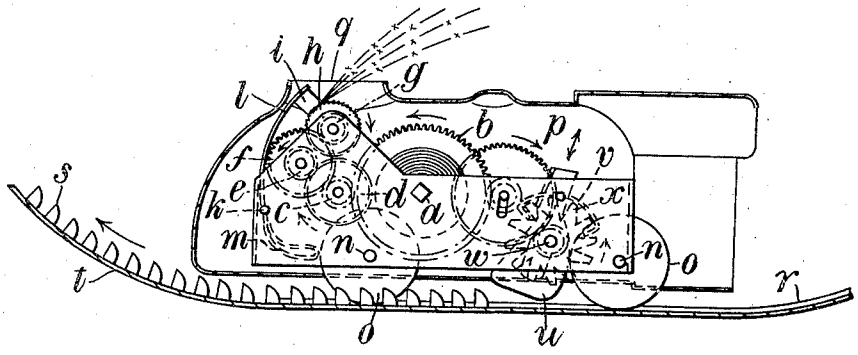


Fig. 1

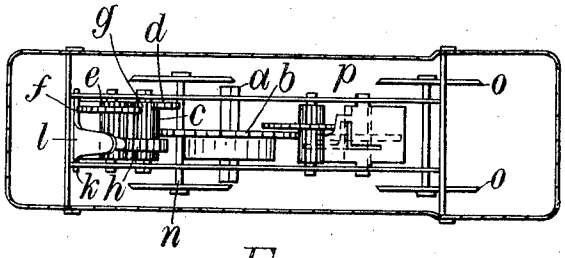


Fig. 2

G. Einfalt
INVENTOR

By: Glascock Downing & Seebold
Attys.

Patented Jan. 4, 1938 2,104,510

UNITED STATES PATENT OFFICE

2,104,510

TOY RAILWAY

Georg Einfalt, Nuremberg, Germany

Application January 25, 1937, Serial No. 122,318
In Germany February 6, 1936

2 Claims. (Cl. 105—29)

This invention relates to a modification of the toy rack railway described in the United States Patent No. 1,997,512 of April 9th, 1935, in which the driving mechanism is provided with automatic locking and releasing means.

The invention consists in the combination of an intermittently operating driving mechanism of the character described in the said United States Patent with a device for the production of sparks in order to give a playing child, by the production of large sparks, a visible and rather naturally appearing demonstration of the application of "full" power when the vehicle ascends an incline.

The invention is illustrated, by way of example, in the accompanying drawing, in which

Figure 1 shows in longitudinal section a vehicle on a section of the track provided with the automatically locking and releasing device for the driving mechanism and the spark producing device, and

Figure 2 is a plan view thereof.

The vehicle suitable for ascending and descending along the rail and provided with an automatically locking and releasing device is fully described in the United States Patent No. 1,997,512 above referred to; it comprises, however, three further driving axles. The toothed wheel *b* mounted on the winding axle *a* engages with the teeth on the driving axle *c*, the driving wheel *d* of which engages with the toothed axle *e*. The intermediate toothed wheel mounted on the latter axle engages with the driving axle *g* carrying the friction wheel *h*. Against the latter friction wheel the periphery of which is toothed transversely, knurled or otherwise rendered rough, there abuts a cerium-iron flint *i* or another pyrophorous metal attached to one end of a two-arm pressure lever *l* capable of easily rocking around a pivot *k* and the lower arm *m* of which ensures, by its special formation or by the provision of a special weight, that the said flint *i* shall abut against the periphery of the friction wheel *h*.

The driving mechanism above described is made capable of running along a track by being provided with running axles *n* carrying running wheels *o* provided at the ends thereof. The whole of the mechanism is mounted within a suitably stamped casing *p*, which, in the present example, is made to resemble a modern high speed locomotive having a short chimney *q* within which the friction wheel *h* is mounted and through which the sparks pass into the open.

The rails required to complete the toy consist, as described in the United States Patent No. 1,997,512, of the descending rails *r*, which may be smooth or have a profile corresponding to the track, and ascending rails *t* provided with teeth *s*. As explained in the said patent the running mechanism includes a pawl *u* lying within the range of the teeth of the rack rail, which pawl is mounted in the recess of a curved member *v* having a guiding slot and within this guiding slot the pawl slides over the driving axle *w*, on which axle is mounted a special toothed wheel *x* for engaging in the teeth of the rack rail. In the teeth of this special toothed wheel a tongue on the pawl engages so that when the pawl is lifted by impinging against the teeth of the rack rail the motor can run down and when the pawl is dropped the motor is locked.

When a vehicle such as above described, after having been wound up, rolls down a descending section of the rail track provided with descending and ascending sections, it will move forward merely by its kinetic energy, without the power of its driving mechanism coming into action. This portion of the running of the vehicle represents the running of a locomotive (to which any other vehicle may be coupled), "without steam" along the inclined part of the rail *r*. Only upon the vehicle coming against a tooth *s* of the rail section *t*, which is toothed along its whole length, is the driving mechanism released, as explained in the above mentioned U. S. A. patent. Now the rotation of the wheels of the driving mechanism will cause not only an ascending of the vehicle along the ascending rail *t* by the engagement of a toothed wheel with the teeth provided on the rail *t*, but will also render visible the strong sparks which will escape through the chimney *q*. By the engagement of the toothed wheel *b* with the driving axle *c* and by means of the intermediate axle *e* and intermediate wheel *f*, the driving axle *g* and therewith the friction wheel *h* is caused to rotate at a high speed. Owing to the flint *i* abutting against the periphery of the rotating friction wheel, sheaves of sparks are produced in a known manner. These are especially strong, since the pressure lever *l* carrying the flint is not rigidly mounted and can thus rock easily, whereby under the action of the lower lever arm *m*, acting as a counter-weight, any unevenness between the friction wheel and the flint is equalized.

The ejection of the sparks through the chimney of the locomotive in a direction towards the stand of the driver, owing to the proper positioning of the friction wheel, while running up an ascending rail, produces the impression, not only in the case of a child but of any observer, that the locomotive requires much power to overcome

the ascent, and has thus to make use of "full steam" when ascending, as is almost always the case with industrial locomotives; especially as in the latter case, the exhaust steam escaping through the chimney in most cases is accompanied by an intensive escape of sparks from the fire-box.

Instead of enclosing the driving gear with the additional means for the production of sparks within a casing resembling a locomotive, the same may be mounted within a casing resembling any other industrial vehicle, and the rail system be adapted to imitate the surroundings appropriate for the running of such a vehicle. For instance, the whole system of smooth descending rails and toothed ascending rails may be adapted, for instance, by some special covering, to imitate a hilly covering place and the vehicle be made to resemble an armoured car adapted to fire when attacking a hill. In this case the direction of rotation of the friction wheel will have to be altered so that the sheaves of sparks are directed forward, for instance from the barrels of guns mounted in a gun tower of the armoured car.

What I claim is:—

1. A toy railway vehicle in combination with a toothed rail; driving means and automatic locking and releasing means therefor mounted on said vehicle, the said locking and releasing means including a toothed wheel adapted to engage in the teeth of the rail and a pawl guided to move vertically and adapted to come in contact with the teeth of the rail and having a tongue adapted to engage with the teeth of the said wheel to lock the wheel when the pawl is in its lower position and to release the wheel when the pawl is lifted by impinging against the teeth of said rail; a spark producing device consisting of a friction wheel, a spark producing flint abutting against the periphery of the friction wheel, a two-arm lever having a pivot on which the lever is mounted in a non-rigid manner, the said lever carrying at the upper end the said flint and being weighted at its lower end; driving axles and intermediate wheels interposed between the driving means and the friction wheel and adapted to drive the latter at a high speed when the driving means are released; and the track having descending smooth rail sections and ascending toothed rail sections, whereby the spark producing device is rendered operative only while the vehicle moves up the rail.

2. A toy railway vehicle as claimed in claim 1 having a casing resembling a locomotive in which the whole of the mechanism is enclosed, the said casing having a short chimney over the spark producing device through which the sparks pass into the open.

GEORG EINFALT.