N. THEOFILOS.

ELECTRIC TOY.

APPLICATION FILED APR. 19, 1920.

1,382,691.

Patented June 28, 1921.

4 SHEETS—SHEET 1.

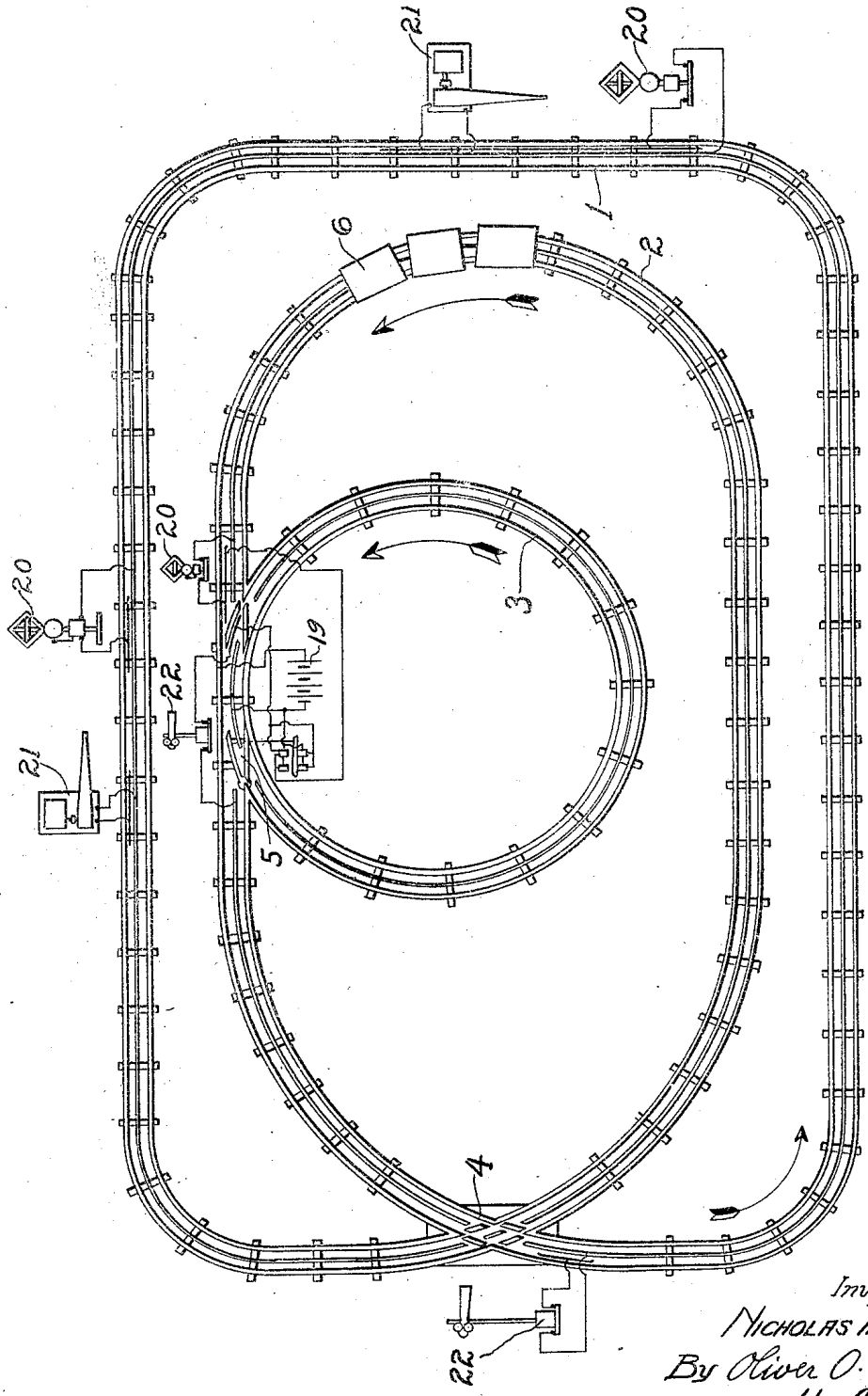

FIG 1

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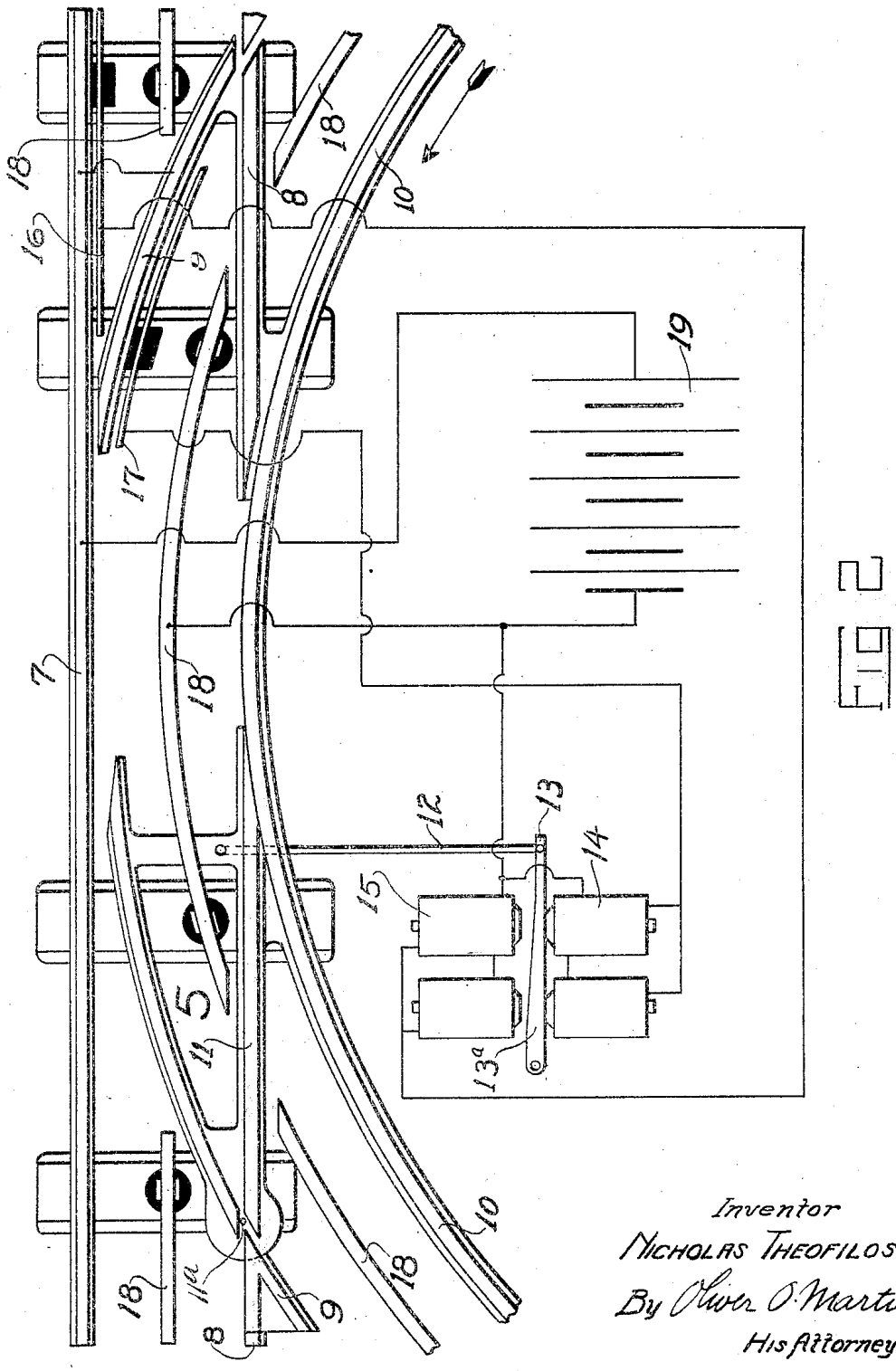

FIG 2

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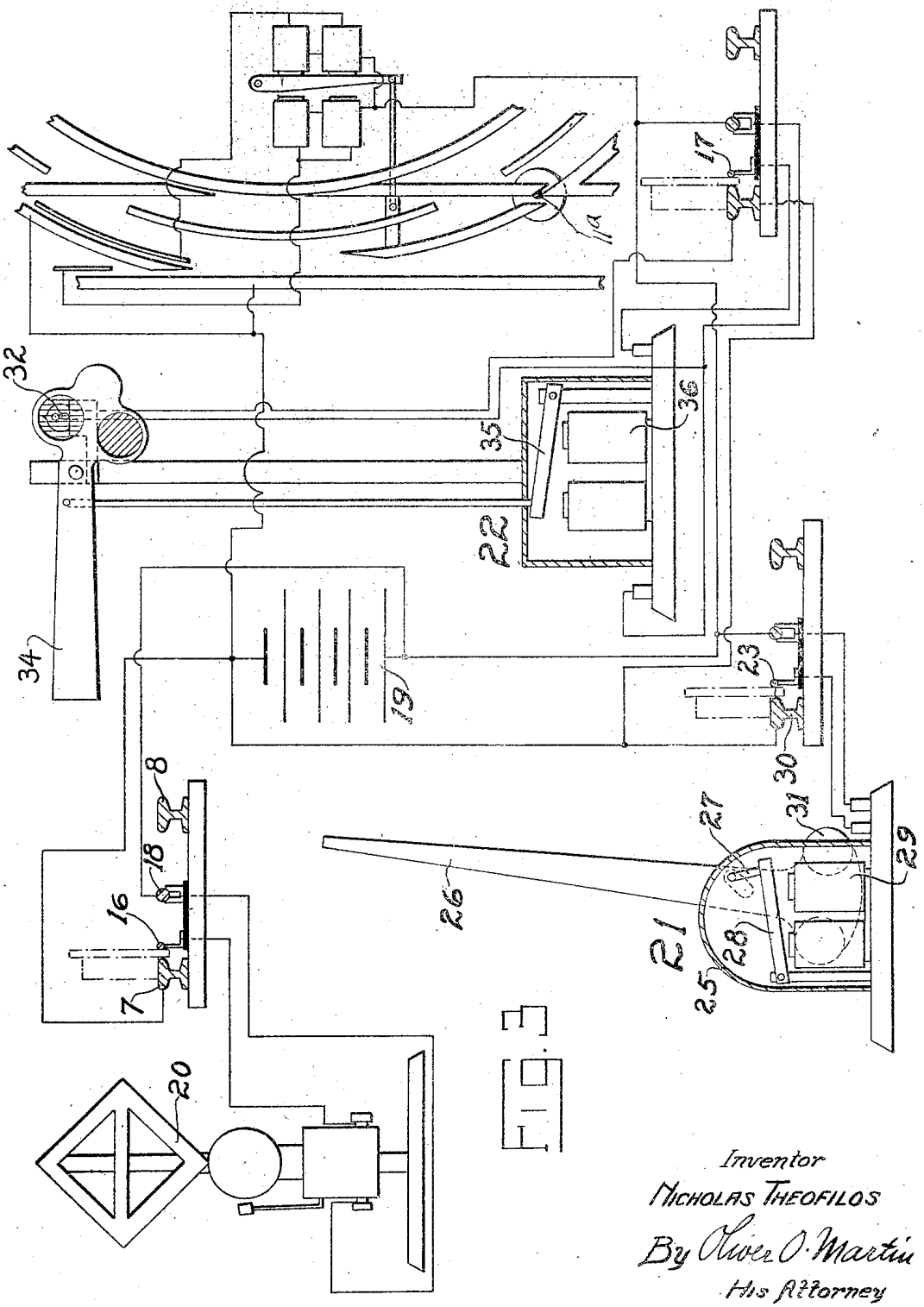
4 SHEETS—SHEET 3.



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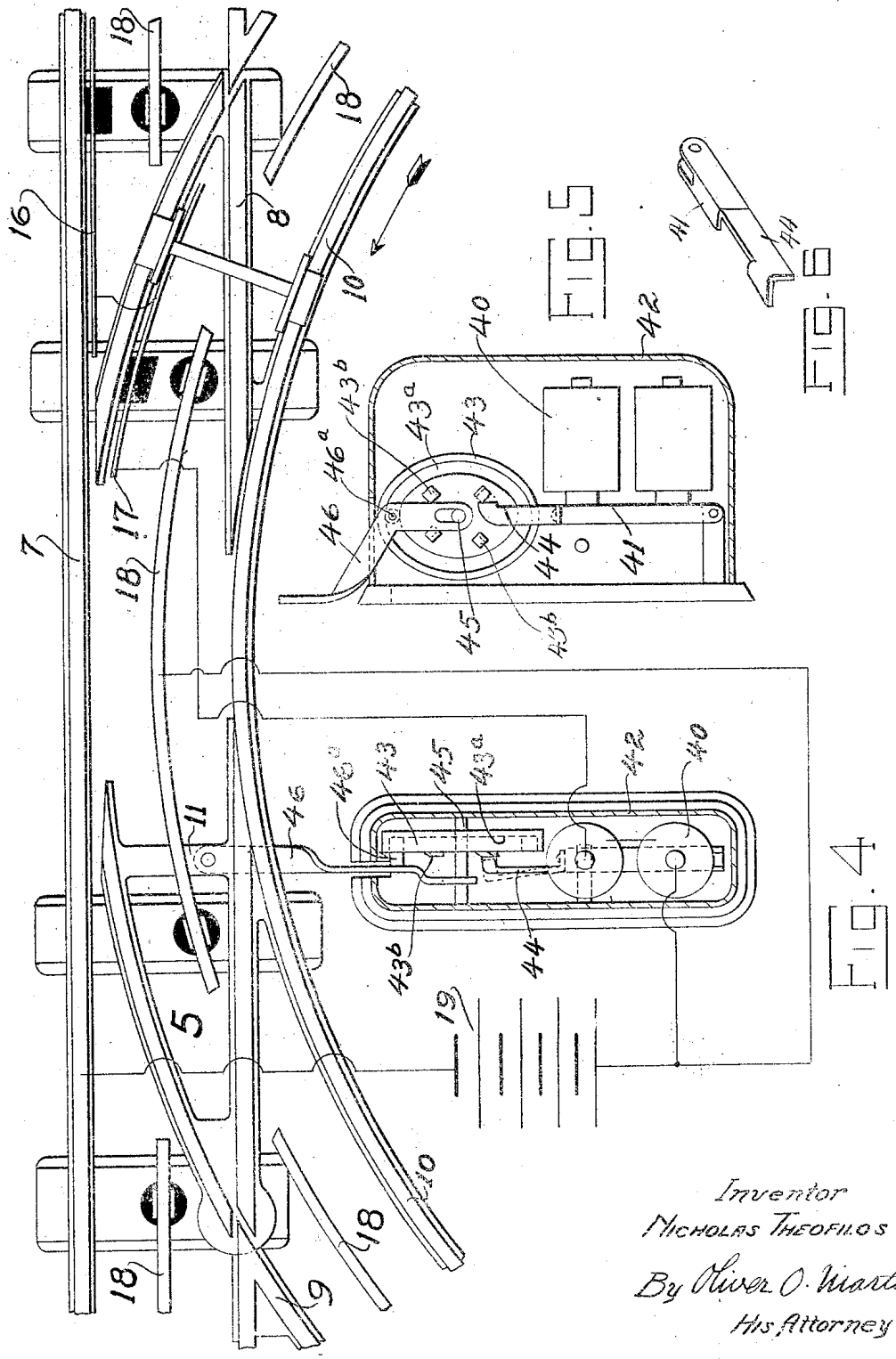

FIG. 5

FIG. 6

FIG. 4

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UNITED STATES PATENT OFFICE.

NICHOLAS THEOFILOS, OF CHICAGO, ILLINOIS.

ELECTRIC TOY.

1,382,691. Specification of Letters Patent. Patented June 28, 1921.

Application filed April 19, 1920. Serial No. 375,041.

To all whom it may concern:

Be it known that I, NICHOLAS THEOFILOS, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in an Electric Toy, of which the following is a specification.

This invention has relation to a toy, and has particular reference to an electric toy railway system.

Electric toy railways are quite common, and they are among the most desirable gifts for children, because they fire the child's imagination and induce him to study mechanical and electrical problems and phenomena, thereby fostering and developing inventive genius.

To this end the principal object of my invention is the provision of a system of tracks sufficiently complex to tax the child's reasoning power and ingenuity. A further object is to simplify the structure in order that it may be cheaply produced. The further objects and advantages of the invention are hereinafter fully described and illustrated in the appended drawings, of which:

Figure 1 is a plan view in which the entire system is illustrated,

Fig. 2 illustrates, on a larger scale, portions of Fig. 1,

Fig. 3 is a diagrammatic view embodying all the electrical connections of the structure,

Fig. 4 illustrates a mechanical-electrical switch operating element,

Fig. 5 is a side elevation of portions of the preceding figure, and

Fig. 6 shows a detail forming part of the two last named views.

Upon examining Fig. 1 it is found that the system of tracks consists in a plurality of loops forming an outer track 1, a middle track 2, and an inner track 3. Connecting the two first named loops is a crossing 4, while a double acting switch 5 connects the middle loop with the inner loop 3. Assuming a train of cars, 6, to be traveling on the inner track 3 in the direction of the arrow, it is seen that it first reaches the switch 5, which will be thrown, as will hereinafter be explained, thereby permitting the train to enter the middle loop. The train next passes the crossing 4 and enters the outer loop 1, from which it reënters the middle loop by traversing the said crossing the second time. As the cars then approach the switch 5, they again cause the latter to be thrown, whereupon the train returns to the inner loop, and one complete cycle is made.

The switch 5, and devices for its operation are clearly shown in Fig. 2. The track 2 comprises an outer rail 7 and an inner rail 8, and the loop 3 consists of the rails 9 and 10. On one side of the switch is provided a member 11 pivoted at 11ª which, through the medium of a rod 12 is operatively connected with a lever 13 carrying an armature 13ª, which in turn is mounted intermediate two sets of magnets 14, 15. On the opposite side of the switch, and adjacent to the rail 7, is a short insulated bar 16. Similarly a bar 17 is placed adjacent to the rail 9. Centrally placed between the outer and inner rails are mounted insulator feeders 18. From one side of a source of energy, 19, extend wires to the rails of all the loops, while the other side is connected with the feeders 18, which, as stated, are insulated from the rails. Wires extend from the said feeders to one side of the electromagnets 14, 15, and the opposite side of the latter are electrically connected with the short contact bars 16, 17. The car closes a circuit between the said feeders and the rails, and is thereby propelled.

As a car approaches the switch from the inner loop 3, as above described, the wheels on its right side come into contact with the bar 17, whereby a circuit is closed through the magnets 14, and the switch is thrown as shown in the drawing, permitting the car to enter track 2. On the other hand, as the car again approaches the switch, this time on track 2, a contact is made between the bar 16 and the rail 7, and the circuit is closed through the magnet 16, thereby again throwing the switch and leading the car back on the track 3.

Along the tracks are mounted a plurality of devices, such as a bell signal 20 and gates 21, and at intervals are placed semaphores 22, all of which are connected, by independent contact bars, to be operated by the same source of energy 19, as best shown in Fig. 3. Thus the bell 20, at the switch may conveniently be connected with the bar 16, and the semaphore with the bar 17. The gate 21 and the other devices may, as stated, have their individual contact bars. The gate 21 comprises a casing 25, in which is hung a counter balanced lever 26, and the latter is by a crank 27 connected with the armature

28 of a magnet 29. As the car wheel passes over the rail 30 and the contact bar 23, a circuit is closed through the said magnet, and the lever is pulled down against its counterweight 31. The semaphore 22 carries light 32 permanently connected to the rail and feeder, so as to emit light while the train is in motion. The semaphore lever 34 carries red and green glass disks for registration with the said light, and the said lever is connected to the armature 35 of the magnet 36 in circuit with the bar 17.

Attention is now directed to Fig. 4, which shows a modified means for throwing the switch 5. In this case only one pair of electromagnets, 40, is used, having an armature 41, which preferably is hung below the said magnets. Adjacent to the magnet, and pivotally hung in the magnet housing 42, is a disk 43 provided with a cam-shaped groove 43^a and having a series of ratchet teeth 43^b. It is noted that the armature carries an extension 44, positioned in the path of travel of the said ratchet teeth 43^b. On the pivot 45 is hung a rod 46, said rod connecting with the pivoted member 11 of the switch 5 and having a projection 46^a seated in the said cam groove 43^a. Each time the magnet 40 is energized, it raises the armature, whose extension simultaneously engages the face of one of the said ratchet teeth and moves the disk 43 a quarter turn. The connecting rod 46 is thereby given a movement toward and away from the disk center according to the alternate windings of the cam groove, and said movement operates to throw the switch back and forth alternately for the purpose hereinbefore described. When the armature falls back its extension piece 44 slides over the incline of the next following ratchet tooth, and in order to facilitate this movement said extension piece is made flexible enough to yield sidewise as it passes over the said incline. This sidewise movement of the extension is indicated in dotted outline in Fig. 4. The above described ratchet and cam mechanism is included in order to demonstrate the possibility of throwing the switch by mechanical means, which is desirable as such mechanical means are less apt to get out of order. It is my aim, as hereinbefore explained, to provide a plurality of loops and to introduce electric and mechanical devices for guiding a car or train of cars around the several loops repeatedly, in order, as stated, to give the child food for thought, and with a view of providing a toy of greater merit than has heretofore been attained.

I claim:

1. In a toy, three track loops arranged within each other, a switch at the junction of the two inner loops, a pair of electromagnets, a rotatable cam mechanism operatively connected to throw said switch alternately back and forth, and elements on the armature of said magnets for rotating said cam mechanism.

2. In a toy, the combination with a pair of tracks a battery and a car, of a switch, an electromagnet, a disk adjacent to the said magnet, said disk having a cam groove and provided with a series of ratchet teeth, an armature having an extension for engagement with the said ratchet teeth, and a rod riding in the said groove and connecting with the said switch for the purpose of throwing the latter alternately back and forth.

In testimony whereof I have hereunto affixed my signature.

NICHOLAS THEOFILOS.