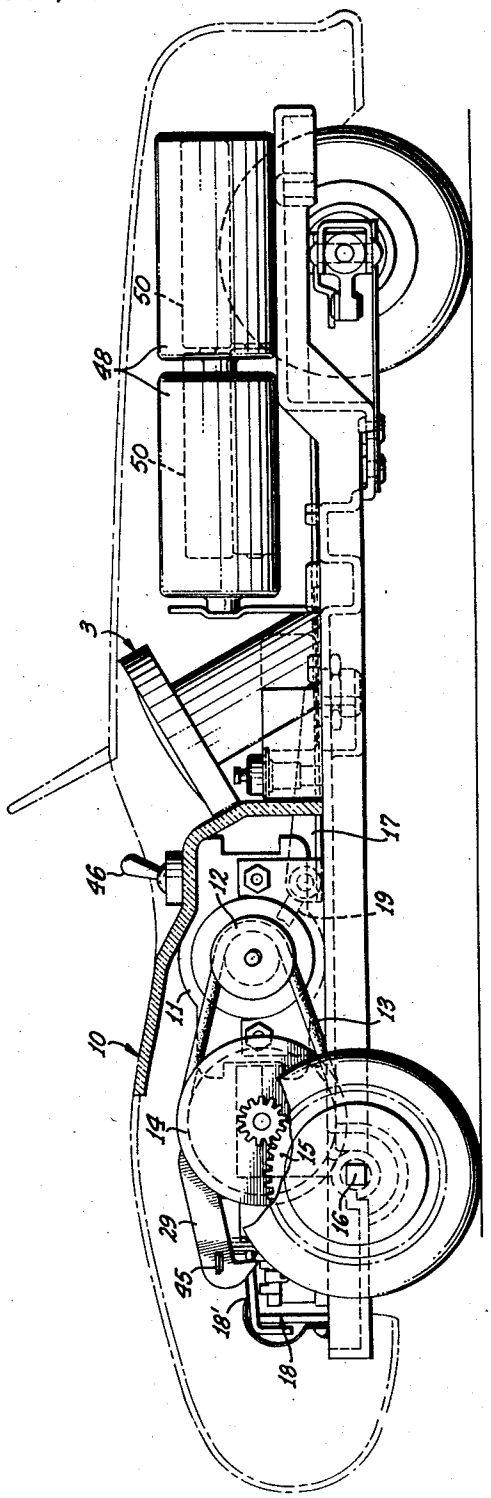
June 30, 1959 J. W. RYAN 2,892,290

TOY CONTROL SYSTEM

Filed Jan. 22, 1957 6 Sheets-Sheet 1

Fig. 1.



JOHN W. RYAN,
INVENTOR.

HUEBNER, BEEHLER,
WORREL & HERZIG,
ATTORNEYS.

BY Albert M. Herzig

June 30, 1959 J. W. RYAN 2,892,290

TOY CONTROL SYSTEM

Filed Jan. 22, 1957 6 Sheets-Sheet 2

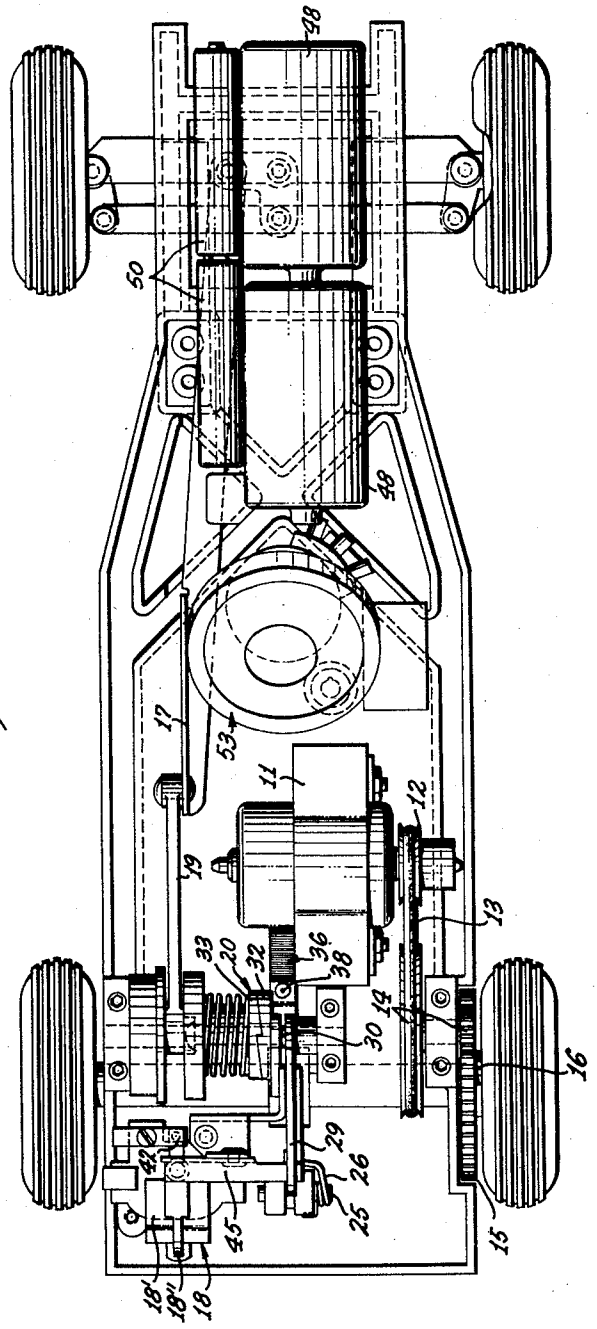


Fig. 2.

JOHN W. RYAN,
INVENTOR.

HUEBNER, BEEHLER,
WORREL & HERZIG,
ATTORNEYS.

BY Albert M. Herzig

June 30, 1959 J. W. RYAN 2,892,290

TOY CONTROL SYSTEM

Filed Jan. 22, 1957 6 Sheets-Sheet 3

Fig. 3.

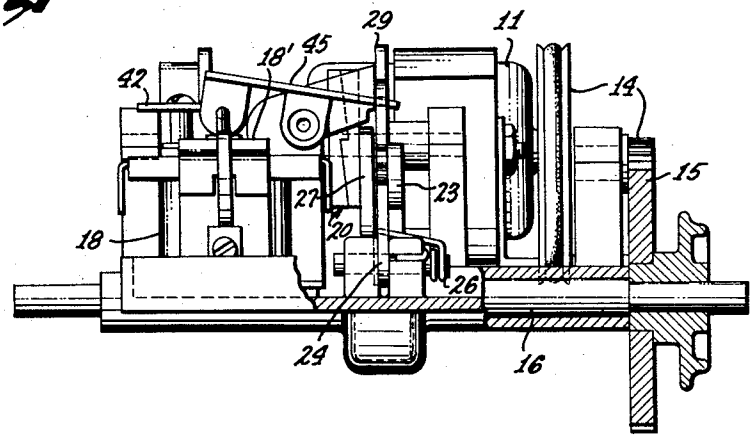
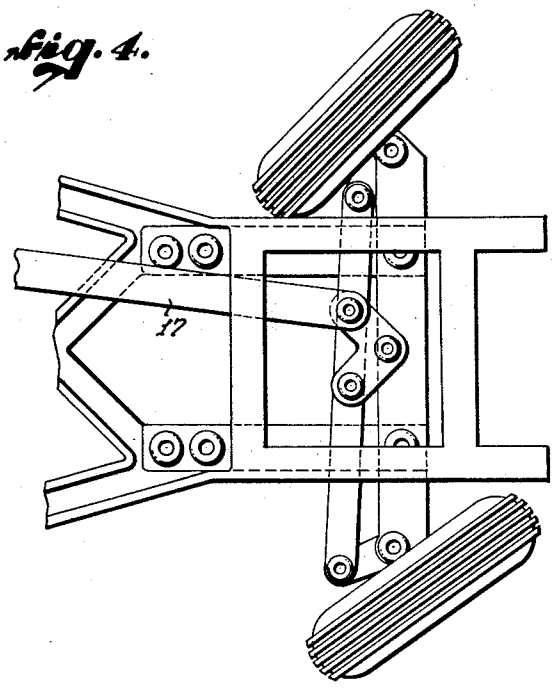


Fig. 4.



JOHN W. RYAN,
INVENTOR.

BY HUEBNER, BEEHLER, WORREL & HERZIG, ATTORNEYS.

Albert M. Herzig

June 30, 1959 J. W. RYAN 2,892,290

TOY CONTROL SYSTEM

Filed Jan. 22, 1957 6 Sheets-Sheet 4

Fig. 5.

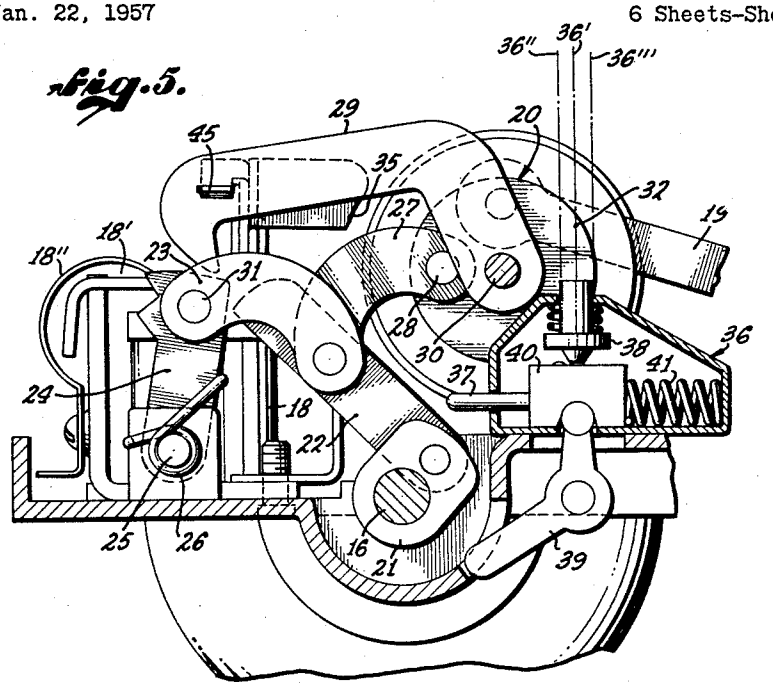
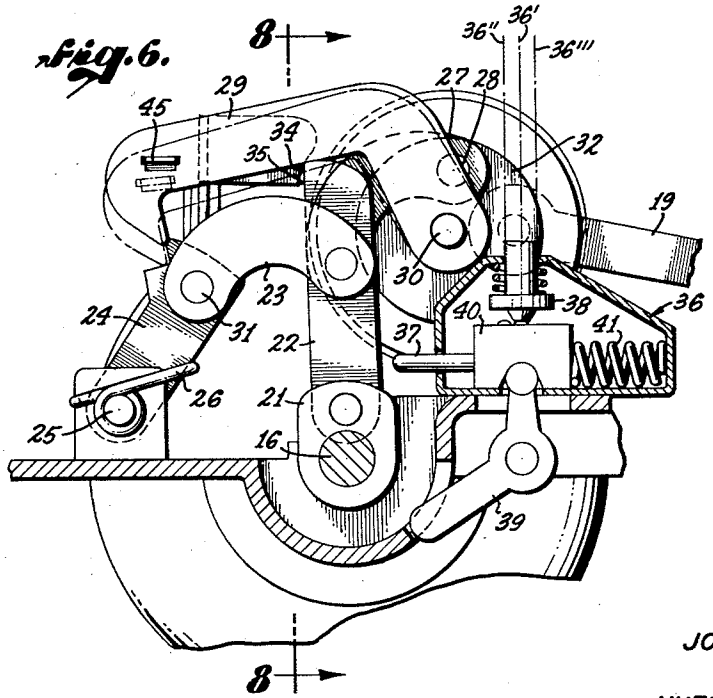


Fig. 6.



JOHN W. RYAN,
INVENTOR.

HUEBNER, BEEHLER,
WORREL & HERZIG,
ATTORNEYS.

BY Robert M. Herzig

June 30, 1959 J. W. RYAN 2,892,290

TOY CONTROL SYSTEM

Filed Jan. 22, 1957 6 Sheets-Sheet 5

Fig. 7.

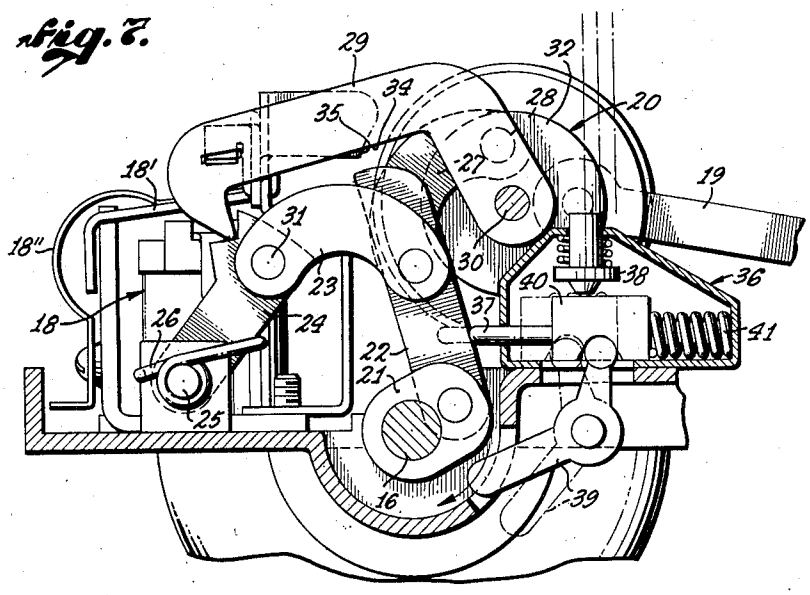


Fig. 8.

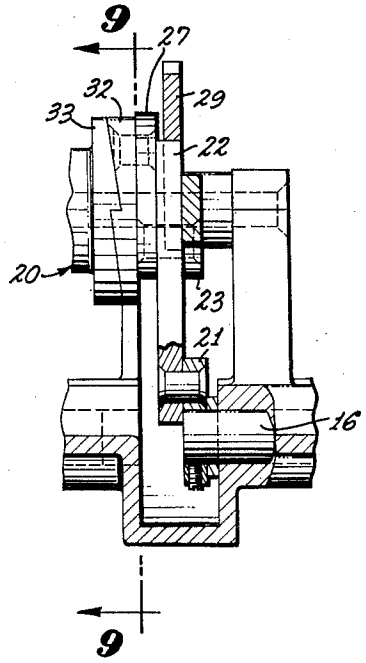


Fig. 9.

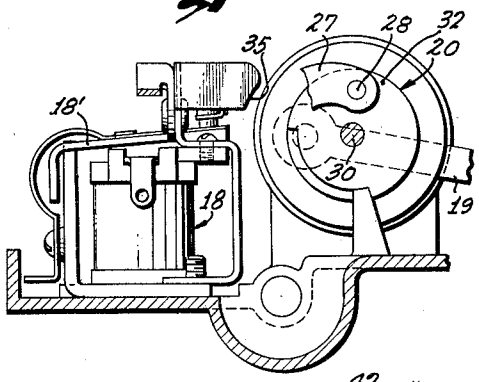
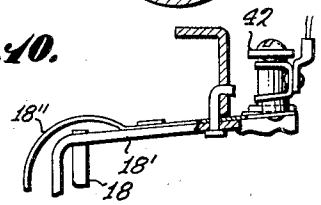


Fig. 10.



JOHN W. RYAN,
INVENTOR.

HUEBNER, BEEHLER,
WORREL & HERZIG,
ATTORNEYS.

BY

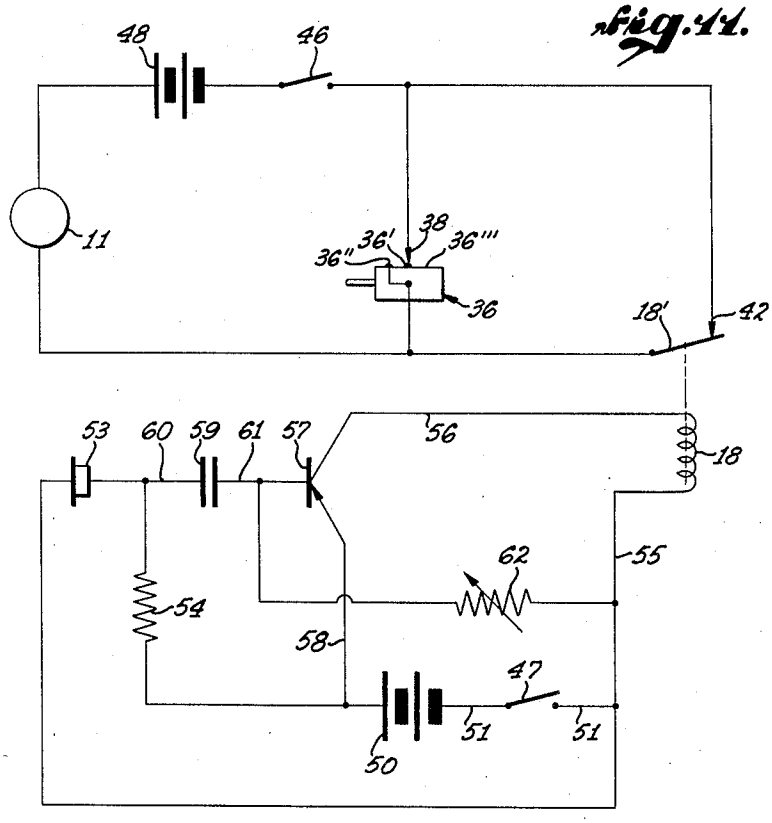
Albert M. Herzig

June 30, 1959 J. W. RYAN 2,892,290

TOY CONTROL SYSTEM

Filed Jan. 22, 1957 6 Sheets-Sheet 6

Fig. 11.



JOHN W. RYAN,
INVENTOR.

BY HUEBNER, BEEHLER, WORREL & HERZIG, ATTORNEYS.

Albert M. Herzig

United States Patent Office 2,892,290
Patented June 30, 1959

2,892,290

TOY CONTROL SYSTEM

John W. Ryan, Los Angeles, Calif.

Application January 22, 1957, Serial No. 635,382
5 Claims. (Cl. 46—244)

This invention relates to motor operated toys, and more particularly to such a toy incorporating means for remote control of its operation by radiant energy.

Commercialized toys of this general type, in the prior art, have generally required two motive sources: one used primarily for power to provide motion, which is then controlled by an arragement employing a second control motive source to accomplish the desired control functions. A type of such toy, for example, is a motor-driven automobile, boat, or airplane, with remotely-controlled steering, ordinarily employing one motor for propulsion, and a second motor to power the control of steering.

Toys remotely controlled by radiant energy have also heretofore required the use of a sensitive relay in the control system. A sensitive relay, capable of operation by a current of one or two milli-amperes, is a delicate, critical and expensive element, subject to false operation by vibration and presenting a problem to maintain in the close adjustment required.

In addition, toys employing a sensitive relay to control operation of a control actuation escapement have hitherto required the use of a secondary electromagnetic actuator, or "kick relay," energized through the contacts of the sensitive relay to accomplish mechanical control of the escapement. Such a secondary actuator generally draws a relatively heavy current of about a quarter of an ampere, requiring a power source capable of supplying this demand. The armature of such actuator is not mechanically free when operated, and is generally required to overcome friction at the point of engagement with the escapement in order to achieve its function.

In view of the above, among other considerations, it is among the objects of this invention to provide a new and improved toy requiring fewer, less critical and more economical elements to accomplish the desired function than heretofore required in motor operated toys incorporating remote control systems.

Another object of this invention is to provide a sensitive, effective, efficient, economical combination of electrical and mechanical means remotely controlling a toy such as an automobile.

Another object of this invention is the provision of a new and improved unitary power means for a toy.

Yet another object of this invention is the provision of new and improved relay control means for toys and the like.

Still other objects of this invention are the provision of a device of the desired character described which overcomes objections in connection with prior art devices, including the omission and simplification of elements, and the design, structure and arrangement of the elements to achieve ease and economy of fabrication and assembly on a mass production basis.

Among the more specific objects of the invention is the provision of improvements over prior art devices and components thereof heretofore intended to accomplish

generally similar purposes in toys as well as for general utility.

Thus, it is among the objects of the invention to provide, alone and in combination, new and improved remote control means, new and improved unit power means for achieving motion and for directing and controlling said motion, new and improved sensitive relay means, new and improved electrical and/or mechanical means for operating said relay means, new and improved means for achieving predetermined selective discrimination in respect of operative radiation frequencies, and new and improved means for reinforcing said predetermined operative radiation frequencies for use.

Additional and further objects will be detailed and become apparent from the following description considered in the light of the accompanying drawings and as more comprehensively disclosed in the appended claims.

In the drawings:

Figure 1 is a side elevational view partially in section of a toy automobile embodying this invention.

Figure 2 is a plan view of the toy automobile shown in Figure 1.

Figure 3 is a partial rear view of the automobile shown in Figures 1 and 2.

Figure 4 is a front portion of the view shown in Figure 2, showing the operation of the front wheel turning mechanism.

Figure 5 is a partial side elevational view, partially in section, showing the details of the escapement mechanism in a situation when the control relay is energized to hold its armature down.

Figure 6 is a similar view showing the escapement mechanism in a situation when the control relay armature is released.

Figure 7 is a similar view showing the escapement mechanism wherein the control relay receives a signal of relatively long duration.

Figure 8 is a vertical sectional view taken on the line 8—8 of Figure 6.

Figure 9 is a vertical sectional view taken on the line 9—9 of Figure 8.

Figure 10 is an enlarged partial detail view showing the relay contact of Figure 9.

Figure 11 is a diagram of a control circuit embodying this invention.

Referring more particularly to the drawings, there is shown by way of illustration but not of limitation a preferred form of this invention as embodied, for example, in a toy automobile.

Upon a frame or body **10** of the automobile is suitably mounted an electric motor **11**, supplying power as through a pulley **12** and a belt **13** coupling the same with a pulley and pinion gear combination **14**, the pinion gear, for example, being meshed with a driven reduction gear **15** coupled to rear axle **16**.

The axle **16** is connected from a driven wheel, the right rear wheel as illustrated, to the steering escapement mechanism mounted at the left rear portion of the automobile frame, as shown in Figure 2, whose purpose is to control the power delivered by axle **16** to the steering escapement mechanism in such a manner as to provide controlled intermittent movement of the steering drag link **17** so that steering may be accomplished selectively when the normally energized coil of a relay **18** is relatively de-energized and its armature **18'** released by a control signal, as will be explained.

The steering is accomplished as follows: Moving the steering drag link **17** forwardly accomplishes a right-hand turn of the car, while backward movement thereof accomplishes a left-hand turn. Its central or neutral position accomplishes a straight-forward car movement.

These various movements of steering drag link 17 are achieved in a cyclical fashion, as follows: forwardly for right-hand turn; rearwardly to neutral for straight ahead; further rearward for left-hand turn; neutral for forward; and forward further for straight ahead, etc., intermittently, in response to control.

A connecting link 19 connects the steering drag link to an intermittently operating rotary clutch mechanism 20, which has any number of positions, as four, in which case each is approximately 90° apart. A single operation of the steering escapement mechanism causes the intermittently operating clutch 20 therefor to be advanced, in an arcuate stroke, approximately 90° each time relay 18 releases its armature 18' in response to a steering signal. The mechanism by which this is accomplished will now be described by referring to Figure 5.

Attached to the axle is an eccentric crank 21 which rotates in a clockwise direction, relative, for example, to Figure 1. Connected to the eccentric crank 21 is the main drive link 22 of the escapement mechanism. Clockwise rotational movement of the eccentric crank 21 causes the main drive link 22 to oscillate back and forth in a linear manner similar to a connecting rod. This reciprocating motion is transmitted to intermediate links 23 and 27. The remote end of link 23 is pivotally connected to rocker link 24, the lower end of which is pivoted to the chassis about a point 25. The rocker link 24 is lightly spring-loaded in a counterclockwise direction (see Fig. 5) by torsion spring 26.

In the operation of said steering mechanism, as shown most clearly in Figures 5, 6 and 7, eccentric crank 21 makes a revolution in a clockwise direction by means of the motor 11, causing a reciprocating movement of the main escapement drive link 22. This in turn induces a reciprocating motion in the intermediate link 23, which in turn causes a rocking movement of link 24 rotating about point 25. The function of torsion spring 26 is to provide a force counterbalancing the eccentric link 21, so that only a rotary motion is normally imparted to connecting link 27 about its point of connection 28 to the clutch mechanism 20. This rotation produces no movement of the clutch mechanism, since the pivot 28 is a bearing about which the link 27 may freely oscillate.

Latch 29 is pivoted about point 30 and is connected to the relay 18, as shown in Figures 2 and 3, by an intermediate bell crank 45, so that the latch 29 is raised and lowered in accordance with the position of an armature 18' of the relay 18.

Thus, when a signal in the form of a decreased coil current, as will be described, is received by relay 18, the armature is released by a decrease in the magnetic pull of the relay coil 18, thereby permitting the armature spring 18'' to raise the armature 18' on relay 18. Since the armature 18' is connected to the bell crank 45 and to the latch 29, the latch drops down as the relay armature 18' is released and forced up by the armature spring 18''. These actions are promptly initiated by a suitable short control signal.

Furthermore, as the rocker link 24 moves forwardly, clockwise, about point 25, as shown in Figures 5 and 6, it is engaged by the lowered latch 29, as indicated in Figure 6, and restrained from rearward movement. Intermediate link 23 is now forced to pivot only about point 31 by the back and forth movement of the main escapement drive link 22, which is normally reciprocated by the eccentric link 21.

Clutch connecting link 27 is now therefore forced to move with a forward reciprocating motion induced by the link 22, causing the driving half of the intermittent clutch mechanism 32 to turn clockwise (relative to Figures 5–7) about point 30, approximately 90°. The driven half 33 of the clutch which is connected to the steering drag link causes the position of said drag link 17 to be changed accordingly. Further rotational movement of the eccentric 21 conversely slips the clutch driving member 32 counterclockwise, approximately 90°.

Thus, at each signal received by relay 18, latch 29 drops, as aforesaid, thereby arresting the normal oscillating movement of the rocker arm 24 and the corresponding intermittent movement of the main drive link 22 to produce an arcuate movement, of about 90°, of the driving half of the clutch 32, which causes the driven half 33 of the clutch also to be rotated through about 90°, and causing the connecting rod 19 either to advance or retract, according to the position of the driven half of the clutch 33. This produces a controllable movement in the steering connecting link 17, in a cycle, as heretofore noted, as follows: forward, back to neutral (for straight ahead), back from neutral (for left turn), forward to neutral (for straight ahead), forward from neutral (for right turn), and back to neutral (for straight ahead), in a cycle of intermittent motion which produces a steering cycle, respectively, as follows: right, straight, left, straight, right, straight, left, straight.

Since the operation of the relay 18 is arranged so that a very small signal causes it to drop out or open, in a manner to be described, it must be reset to its closed position in order to be sensitive and effectively respond to another signal. Therefore, the main drive link 22, when it has driven the clutch connecting link 27 to the end of its travel in moving the driving clutch half 32 through its clockwise arc, simultaneously engages latch 29, as at point 34, as shown in Figure 6, thereby restoring said latch 29 to its elevated position, and also thereby resetting the relay 18 through the intervening bell crank 45. The relay, being at all times energized, except on the occurrence of a signal, as will be described, is now once again in its closed or latched sensitive position ready to respond to another control signal. It is also assumed above that the steering control signal was relatively short—that is, only long enough to de-energize the coil 18 and cause the latch 29 to drop.

Other means are provided which cause the automobile in this case to stop and start upon direct command, as by a relatively long control signal.

In order to stop the car, which is in motion so long as the axle 16 rotates, a signal of relatively long duration is supplied to the relay 18, and this produces an alternative mode of operation of the escapement mechanism, as illustrated in Figures 5, 6 and 7, to wit: The main drive link 22 resets the latch 29 at the upward end of the steering cycle by striking point 34, as before, thus releasing the rocker link 24 so that it is free to be rotated about point 25 against its normal counterclockwise bias through the action of torsion spring 26. This biasing, however, is resisted for a fraction of a cycle by the action of a stationary cam surface 35, at the latch 29, as best shown in Figures 5–7, until main drive arm 22 has been retracted downwardly sufficiently to clear said cam 35, and on the assumption that the control signal has continued to de-energize the control relay coil 18.

During this camming action, the latch 29, which has just been raised to its upper position, will nevertheless return toward its downward position and follow, in part, the downward movement of the arm 22, rather than being held up by relay 18 and bell 19, so long as a long signal is being given, i.e., said long signal causes the continued reduction of current in relay coil 18, whereby its armature 16' is not held down against the tension of its spring 18'', and the falling latch 29 will therefore reengage the rocker link 24. Cam 35 can, if desired for this purpose, be made integral with the arm 29.

When the control signal is of short duration, and has terminated when latch 29 is reset to the raised position, and relay armature 18' is held down by unreduced current in relay coil 18, link 24 is rotated counterclockwise by torsion spring 26 when the upper end of main drive link 22 passes the lower edge of stationary cam surface 35, moving intermediate link 23 to the left and rotating

main drive link 22 counterclockwise about its lower end's point of attachment to eccentric crank 21.

When the control signal is of long duration, resulting in immediate re-engagement of rocker link 24 by falling latch 29, as described, instead of the counterclockwise motion otherwise following reset, such latching action causes the central portion of the main drive link 22 to assume a new position which it never occupies during short signal operation, in that the central portion thereof moves relatively further to the right than during short signal operation. Therefore, it operates an electrical stopping and starting switch 36, whose operating bar 37 is driven to the right and cocked by this extraordinary action of the link 22.

Said switch 36 has three positions: 36', 36'', and 36''', each of which is maintained by a detent 38, the first being a central position 36', the second a cocked position 36'', and the third an "open" position 36''', the first and second being closed positions. The angular position of the switch rocker arm 39, as shown in Figures 5 and 6, indicates that the switch slider 40 is in its central position 36', as also shown in Figure 11, so that current is being supplied through said switch to the drive motor. The rocker arm 39 position, as illustrated in Figure 7, in solid lines, corresponds to the first "on" position 36', and, in phantom lines in said Figure 7, to the "off" position 36'''.

Returning to Figure 7, when bar 37 is driven to the right by the extraordinary motion to the right of link 22, resulting from a long signal being applied to the relay, spring 41 is compressed by the slider 40 being moved to the right by bar 37, as driven there by the link 22. This causes the rocker arm 39 to be rotated so that its lower end projects into the path of the eccentric crank 21, just after said eccentric crank 21 has passed the lower end of the rocker arm 39. Therefore, it remains cocked in this position, by the disclosed or other suitable conventional means, until the eccentric crank completes one more full cycle, during which the main drive link 22 resets the latch 29 to open its associated relay switch 18' in readiness for the next control signal.

This is accomplished, in the embodiment presented, by first cocking the switch 36 to its extreme right-hand travel against the action of the compression spring 41, and then, during the next cycle, causing the switch to be thrown to its "off" position through the action of the eccentric crank 21 striking the lower projection of the switch rocker arm 39, the force of spring 41, and the inertia of the switch, all of which combine to carry the switch all the way to its extreme left-hand position 36''', in which the main power for the motor 11 is turned off. Thus, by causing a longer than usual signal to be transmitted, the car has been stopped, and the escapement mechanism, controlled by the relay 18, has been cocked to receive the next signal which will start the car again. (Any other conventional cocking means may be employed for the switch 36.)

This is achieved by means of an electrical contact 42, cooperative with the relay armature 18', through which power is supplied from the battery 48 to the main drive motor 11 in parallel with the switch 36, which has just been turned to "off" position 36'''. This alternative source of power provided to the main drive motor 11 through the relay armature 18' when it closes on the next steering signal, starts the escapement mechanism turning once again. The first stroke of the eccentric crank 21 causes the bar 22 to bear against the rod 37 and return it from its extreme left-hand position 36''' to its central or neutral "on" position 36'.

A manual switch 46, such as the toggle switch shown in Figure 1, can be included in the escapement circuit to shut it off when desired. A second manual switch 47 (Figure 11) can similarly be included in the receiver circuit. A battery of dry cells 48 can conveniently be used as the source of power for the toy automobile motor 11 and the escapement mechanism. For compactness, the

battery 50, for example, of the circuit shown in Figure 11, can be left out and power can be drawn from battery 48 for the control receiver circuit also, or vice versa.

In the instant preferred embodiment of this invention a control circuit for the signal coil 18, as shown in Figure 11, is as follows:

A battery 50 is connected as through the manual switch 47 through conductors 51 and 52 to a transducer, preferably a microphone 53. A resistance 54 is placed in the microphone circuit to the battery 52.

A coil circuit comprises the battery 50, conductors 51 and switch 47, conductor 55, said coil 18, conductor 56, transistor 57, or the like, and conductor 58.

A capacitor 59 is interconnected as by conductors 60 and 61 between the microphone 53 and the transistor 57.

The input side of the transistor 57 is connected through a fixed or variable resistance 62 to the conductor 55, whereby the transistor or other amplifier 57 is adjusted to approximately saturation output current, and whereby also the relay control coil 18 is adjusted so as to barely hold its armature 18' against the pole-piece of the coil. If desired, a separate resistance may adjust coil 18.

It will be noted in this connection that the armature 18', as previously mentioned, is normally biased by the spring 18'' (cf. Figures 2, 5 and 7) to close the circuit to motor 11, except as said armature is releasably engaged against the pole-piece of the coil 18. The coil current is held at a low value such that while the coil is permitted to hold the armature on contact, or relative proximity to its core, its magnetic attraction for the armature 18' is insufficient to draw said armature by its own attraction from the released position, particularly against the bias of the armature spring 18''. Consequently, the armature 18' is biased to close against the motor circuit contact 42 upon a predetermined reduction of current flowing through the coil 18; and said armature 18' is reset mechanically against said coil 18 by the mechanical latch reset 29, 45, and the driven reset link 22, which operate as heretofore described.

A reduction in the coil current for releasing the armature is achieved as follows: The microphone 53 is selected from inexpensive varieties, so as to peak within the frequency range of a control signal such as obtained by the blowing of a whistle, and to drop off sharply above said frequency. Such peaking or resonant vibration of a microphone within the range of intended use is ordinarily avoided in the prior art and is characteristic chiefly of the most inexpensive types, but is here put to advantage to provide a type of low frequency band-pass filter to provide simultaneously a signal power gain in conversion from the external radiated signal received to the electrical signal in the circuit.

The condenser 59 is selected so as to reduce response to frequencies below the peak of the microphone, so that the net effect of the combination of the microphone 53 and the condenser 59 is to achieve a band-pass effect so that customary noise levels will not effect an undesired control signal for the automobile. Accordingly, only the predetermined signal of the predetermined frequency, intensity and duration will effect a desired control. When such predetermined signal is given, the signal voltage excursions above, and of the same sign, the value at which the transistor 57, or other amplifier, is substantially saturated, will not therefore materially affect the coil 18 current, since they are in a direction to drive only toward saturation the current already substantially at saturation, but the signal excursions of the opposite sign will cause a reduction in the coil current, during a signal originating in the microphone 53, sufficient to permit release of the armature 18'.

If the contact 42 is closed (assuming the switch 36 has heretofore been opened by a long or stopping signal), the motor 11 will be energized to run the automobile. And since the contact 42 and armature 18' are held open

by the coil 18, the car will be stopped unless the switch 36 is closed.

This type of operation is particularly advantageous since the most rudimentary type of relay can be made to operate on a very small signal when it is arranged to just barely hold in on the idling current provided by the receiver so that a minute decrease in this current will cause even a simple inexpensive relay to release its armature. The main problem of providing a large enough change in current between signal and no signal conditions to cause the relay to pull in when no current-reducing signal is being received, has been avoided by arranging the escapement mechanism to automatically reset the relay to its sensitive position as a part of each control operation. This also accomplishes the function of a mechanical follow-up so that the relay, once released, is not returned to the normal position until the control operation is accomplished, making possible reliable, full-excursion control with control signals of short or irregular duration.

Therefore, this resetting mechanism performs two functions: that of a mechanical follow-up device, and that of a resetting mechanism used in conjunction with a simple relay in order to accomplish this function of a more delicate, complicated and inexpensive relay, while permitting armature motion greatly exceeding that of such sensitive relay types. Such extended motion is possible because the armature opens widely and freely when released and need not be constrained to stop at a distance, permitting the relay to be closed again by a weak or even strong current, since reclosing is here accomplished by other means.

By way of further illustration, in practice it has been found that a reduction in coil current of 0.2 milliampere can release the coil armature 18'. With just an ordinary microphone in the circuit shown, and an ordinary police whistle, at ranges of about 75 feet, there is obtained a coil current reduction of up to 4 milliamperes. This extreme margin of current decrease can be used to achieve stability, reliability and freedom from interference of extraneous factors and to further increase the range of operation.

It is understood, therefore, that these advantageous features of the receiver permit the general use of an inexpensive escapement mechanism in combination with the receiver for many other applications of wide utility, and in toys only by example. In all cases it is important that the armature 18' of the escapement be not restrained in any way prior to its receiving the signal. The principle of operation of this escapement is that the armature 18' does no work whatsoever while it is in its receiving position, and moves freely to its open position when released, without being required to do any work such as overcoming friction due to pressure of an engaged latch, as is commonly required in prior art control escapements. Moreover, an inexpensive and effective band-pass signal is achieved by actual signal power gain in the control circuit.

The above described apparatus can, of course, be varied within the skill of the art. For example, other prime movers and control signals could be used in lieu of batteries and electric motors on the one hand, or sound on the other; one battery, or the like, could be substituted for the two batteries 48 and 50; separate resistors could be used in the amplifier control and relay circuits, and so on, as reflected in the claims.

The instant exemplification of the invention therefore features new and improved simplified relay means, new and improved simplified remote control signal means, and new improved escapement means for automatically cycling a steering means responsive to said relay means and said remote control signal means and for selectively stopping and starting a vehicle, or the like, thereby. The invention also features such means for combined and/or independent general utility and usefulness in analogous as well as non-analogous art, and alone or in combination with other prior art devices heretofore jointly and severally utilized to carry out analogous functions.

While I have herein shown and described my invention in what I have conceived to be the most practical and preferred embodiment, it is recognized that departures can be made therefrom within the scope of my invention, which is not to be limited to the details herein, but is to be accorded the full scope of the claims so as to embrace any and all equivalent structures.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a toy vehicle, driving means for propelling said vehicle, steering mechanism on said vehicle, cyclically operable connecting means for selectively drivingly connecting said driving means to said steering mechanism for actuation thereof through one cycle of operation, a coil-actuated relay having a movable armature, said armature being arranged to actuate said connecting means whereby to connect said driving means to said steering mechanism to effect a predetermined cycle of operation thereof.

2. A vehicle as defined in claim 1 wherein said armature actuates said connecting means when it is released by said coil, said connecting means including cyclically operable elements arranged to release said connecting means and thereby disconnect said driving means from said steering mechanism at the end of one cycle of operation.

3. A vehicle as defined in claim 1 including further means actuable by said connecting means, when said armature is released for a plurality of consecutive cycles, to de-energize said driving means and thereby stop said vehicle.

4. In a toy vehicle, power means for propelling and steering said vehicle, control means for said power means, a coil-operated relay having a movable armature arranged to actuate said control means when released from said coil, resilient means normally urging said armature away from said coil, means on said vehicle normally energizing said coil only sufficiently to hold said armature when adjacent said coil and not sufficiently to reset said armature from released position, means actuable by said power means for resetting said armature after each release thereof, and radiant signal responsive means on said vehicle for reducing the energization of said coil sufficiently to release said armature.

5. A vehicle as defined in claim 4 wherein said radiant signal responsive means comprises means responsive to acoustic waves within a predetermined frequency range.

References Cited in the file of this patent

UNITED STATES PATENTS

1,951,505	Dambrine	Mar. 20, 1934
2,631,190	Umphrey	Mar. 10, 1953
2,647,162	Duncan	July 28, 1953
2,717,977	Decker	Sept. 13, 1955
2,718,729	Giardina	Sept. 27, 1955
2,723,492	Muller	Nov. 15, 1955
2,769,946	Brailsford	Nov. 6, 1956
2,773,933	Hawley	Dec. 11, 1956
2,785,356	Nisle	Mar. 12, 1957

FOREIGN PATENTS

607,346	Great Britain	Aug. 30, 1948
988,037	France	Apr. 25, 1951
998,830	France	Sept. 26, 1951