July 13, 1954 C. L. McKNIGHT 2,683,868

TRAFFIC CONTROL SYSTEM

Filed Nov. 4, 1949 3 Sheets-Sheet 1

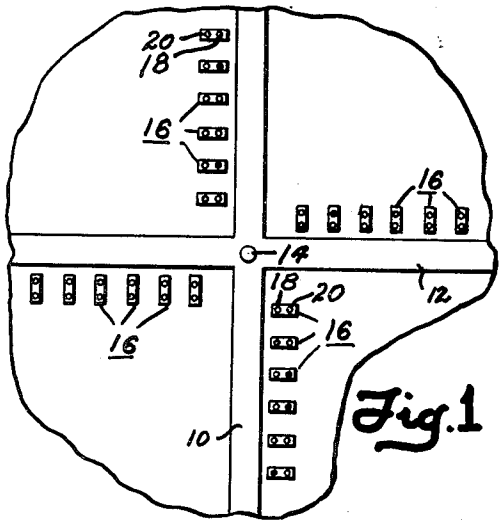


Fig. 1

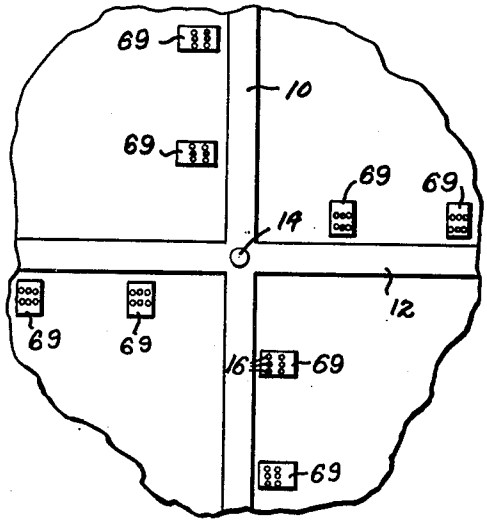


Fig. 2

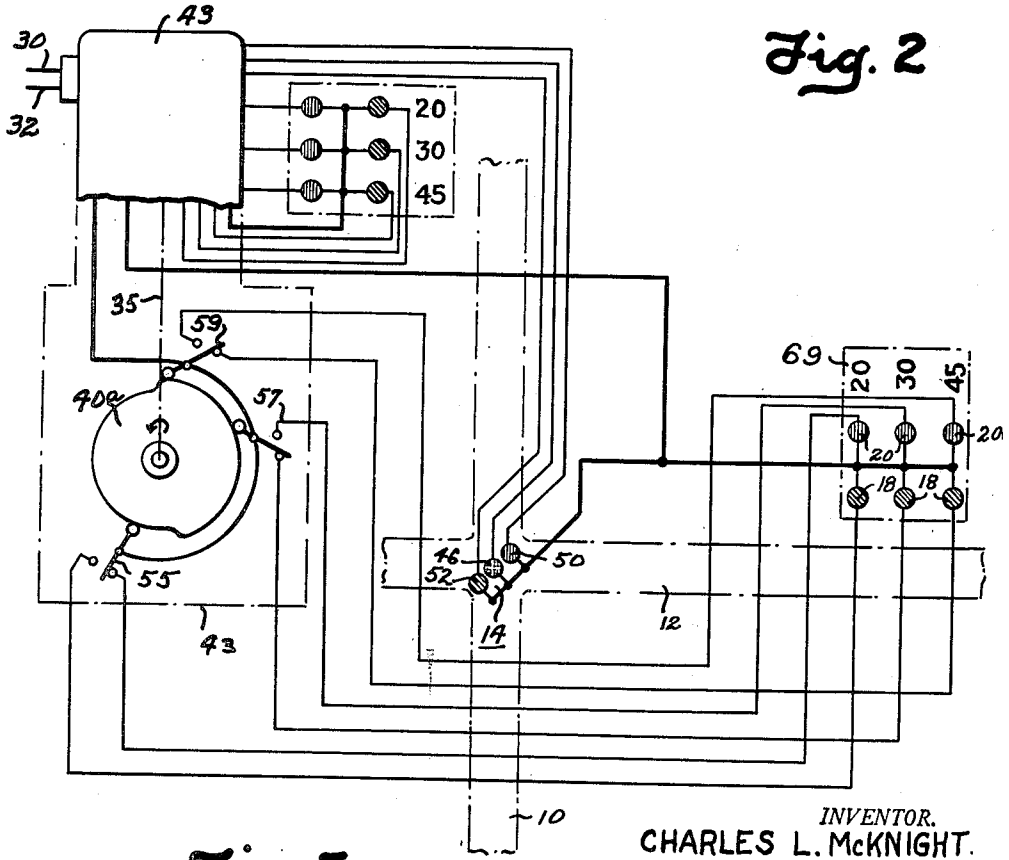


Fig. 5

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3 Sheets-Sheet 2

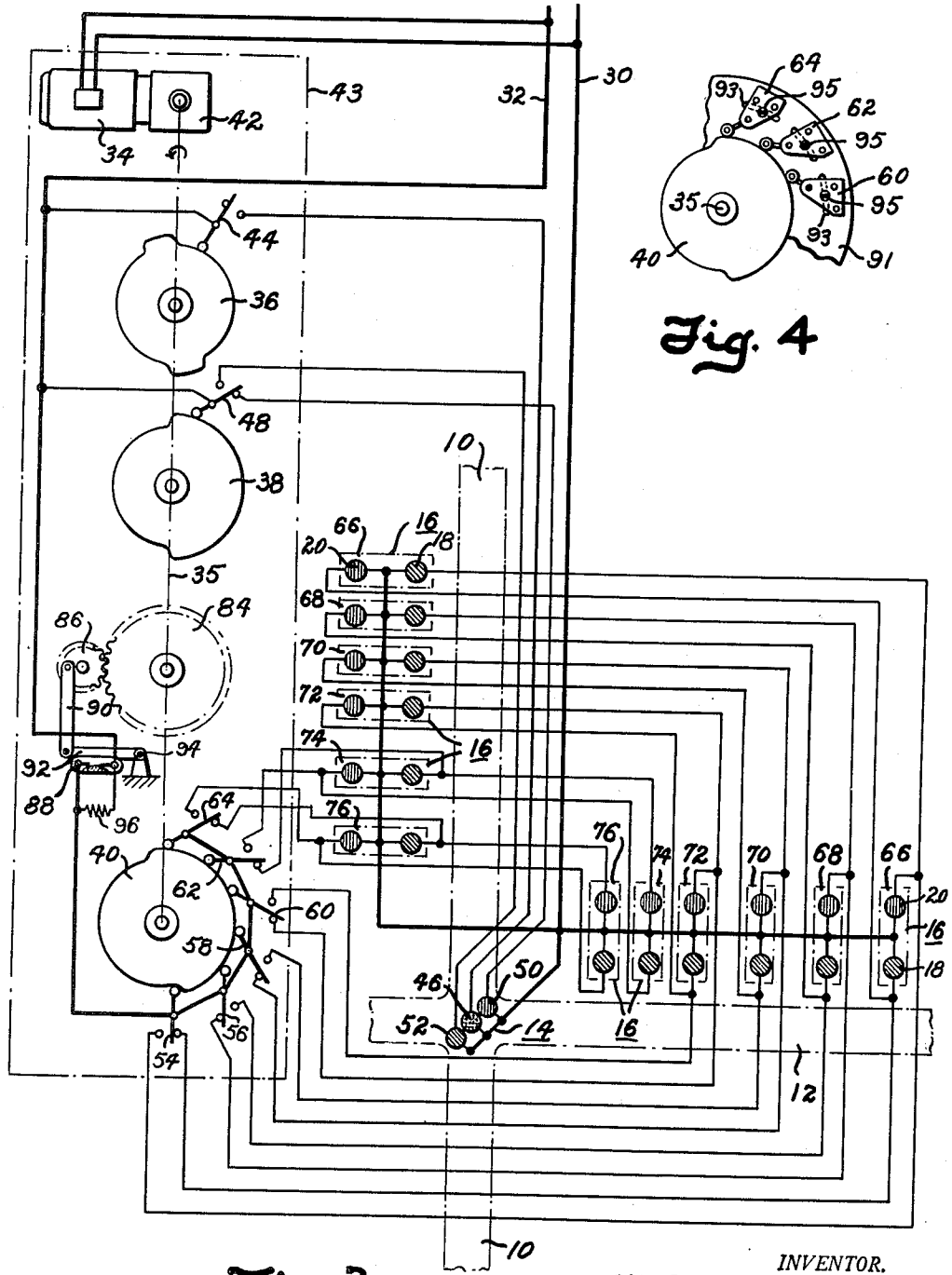


Fig. 3

Fig. 4

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TRAFFIC CONTROL SYSTEM

Filed Nov. 4, 1949 3 Sheets-Sheet 3

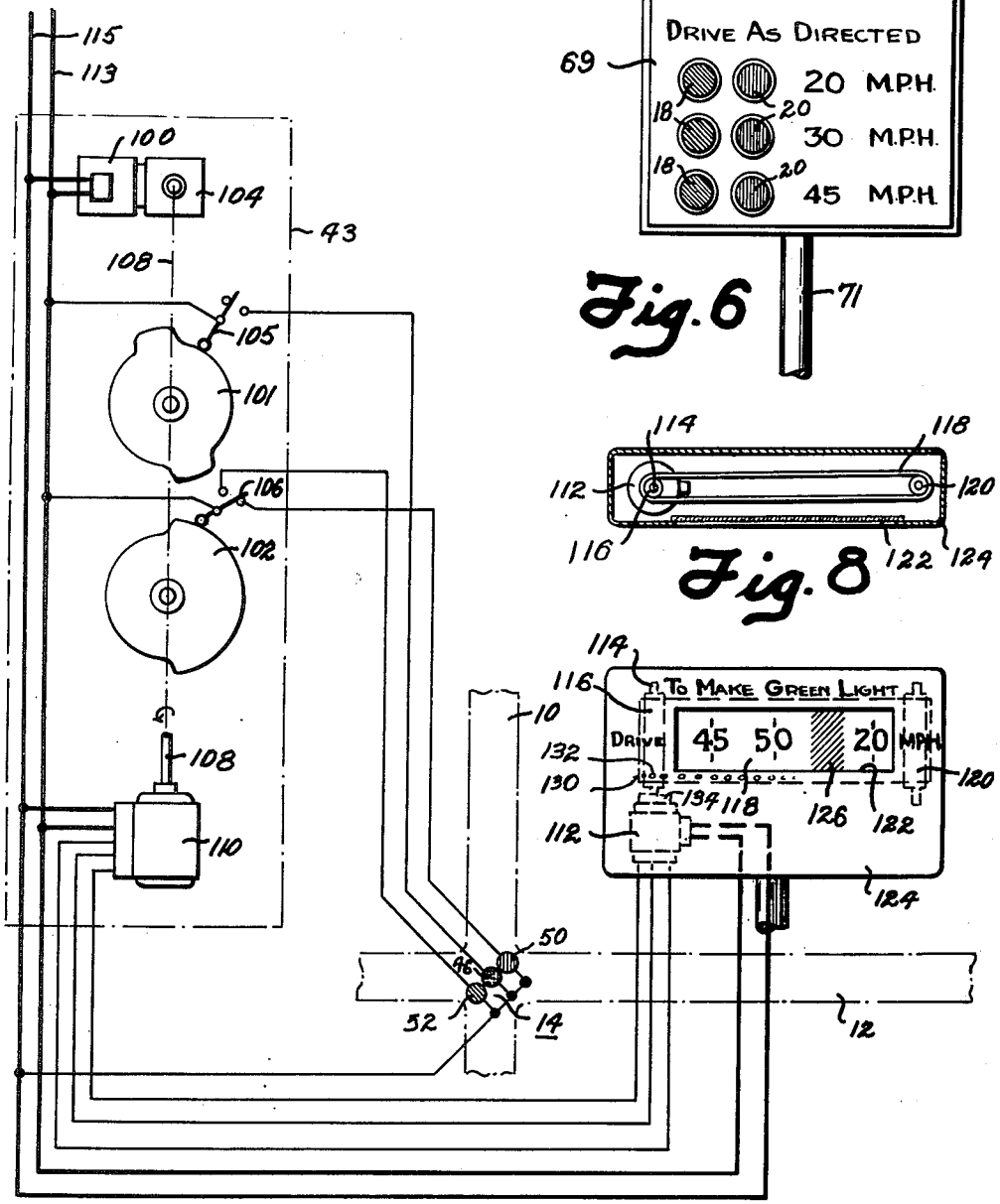


Fig. 7

Fig. 6

Fig. 8

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TRAFFIC CONTROL SYSTEM

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Application November 4, 1949, Serial No. 125,583

21 Claims. (Cl. 340—43)

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This invention relates to a traffic regulating signal system and more particularly to a system in which means are provided for controlling the speed of the traffic approaching intersections of the type provided with stop and go lights.

Every driver prefers to regulate his speed so as to reach a controlled intersection when the light is green, but unless one is familiar with the timing of the lights, this is a very difficult thing to do. Where it is possible to properly regulate the speed so that one does strike the light right, one saves on brakes and eliminates the delay which results from making a stop. Furthermore, the number of cars which can pass an intersection on a green light is much smaller when all cars have to come to a stop before starting up than when all cars are in motion as they approach the light. The inconvenience of having to make complete stops is especially great in the case of heavy trucks which require a much greater distance in which to stop and which require a long period of acceleration after each stop.

It is an object of this invention to provide means for indicating to the drivers what speed to travel as they approach an intersection having a stop and go light so as to avoid the need for coming to a complete stop and so as to expedite the handling of traffic.

It is another object of this invention to provide a simple and inexpensive arrangement which may be used in combination with standard traffic light regulating systems.

More particularly, it is an object of this invention to provide a control which may be added to existing traffic light control mechanisms.

Another object of this invention is to provide a simple arrangement which makes it possible to conveniently tie in the speed indicating mechanism with the traffic light system and yet mount the speed indicating mechanism at a distance from the intersection.

Another object of this invention is to provide a control in which the speed indicating means may readily be adjusted to compensate for changes in the timing of the stop and go periods, et cetera.

Other objects and advantages reside in the construction of parts, the combination thereof and the mode of operation, as will become more apparent from the following description.

In the drawings:

Figure 1 diagrammatically illustrates a conventional highway intersection provided with a series of red and green cue lights arranged at

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spaced intervals along the approaches to the intersection;

Figure 2 is a view similar to Figure 1 but showing a modified arrangement of cue lights and speed indicating means;

Figure 3 is a schematic circuit diagram showing the circuits used for controlling the cue lights;

Figure 4 is an elevational view of an adjustable cam arrangement for use in the operation of the cue lights;

Figure 5 is a schematic diagram showing a modified circuit arrangement;

Figure 6 is a fragmentary elevational view showing one form of speed indicating sign;

Figure 7 is a schematic view showing a still further modification of a speed indicating arrangement; and

Figure 8 is a sectional view taken substantially on line 8—8 of Figure 7.

In Figure 1 of the drawings, I have schematically shown a pair of intersecting highways 10 and 12 provided with a conventional stop and go light unit 14 for use in controlling the flow of traffic at the intersection of the highways. For purposes of simplification of the illustration, I have shown only the one centrally mounted stop and go light unit for directing the traffic on highway 12. This light unit is intended to represent the conventional type of stop and go light units now extensively used. In actual practice separate stop and go light units are usually provided for each approach to the intersection. For convenience of description, a red light at the intersection will be referred to as a "stop" light, whereas a green light at the intersection will be referred to as a "go" light.

A series of cue light units 16 are provided along one side of each of the approaches to the intersection, as shown, in order to indicate to the drivers not only that there is a traffic light at the intersection but also to give some indication to the drivers approaching the intersection how fast they should drive in order to reach the intersection when the light is green. Each cue light unit in the series includes a red light 18 and a green light 20. The operation of these lights is synchronized with the operation of the stop and go lights forming a part of the unit 14, as will be explained more fully hereinafter.

The phase relationship between the cue lights and the stop and go lights is such that if a driver approaches the intersection at a time when he normally can expect to have a green or "go" light, the cue light opposite him on the driveway will

indicate green. The motorist noting the cue light to be green continues on at normal speed, but if the cue light opposite him happens to be red, he reduces his speed so as to arrive at the intersection after the traffic light has switched back to green. By providing a series of cue lights at each approach to the intersection, the motorist is afforded a number of check points along the way from which to gauge his rate of approach. In this system the motorist is obviously allowed some degree of freedom in the selection of the proper approach rate. If the first cue light encountered is green, but the second cue light just turns to red before the driver gets to it, then the driver will know that he will either have to drive faster to make the "go" light or slow down and wait for the next "go" light. However, if the first cue light encountered has just turned to green and the driver comes to the second cue light before it turns to green, this will indicate that he is traveling too fast and must slow down lest he get to the intersection too soon for the light there to change to green. The distance between the cue lights and the number of cue lights used may be varied without departing from the spirit of my invention. Six cue lights have been shown along each approach for purposes of illustrating my invention. The first cue light encountered by a driver should preferably be located at least a quarter of a mile away from the intersection, so as to give the motorist time to adjust his speed. All of the distance involved should take into consideration the maximum speed allowed on the highway, the timing of the stop and go periods, the condition of the highway, et cetera.

Referring now to Figure 3 of the drawings wherein I have shown somewhat diagrammatically the circuit arrangement used in controlling the energization of the various lights, reference numerals **30** and **32** designate the main power lines from which power is supplied to a constant speed motor **34** which is used for driving the timing cams **36**, **38** and **40** through the gear reduction device **42** and the cam shaft **35**. The motor **34** and the timing cams operated thereby are located within a common housing **43**. The cam **36** operates a switch **44** which controls the energizaton of the amber light **46** in accordance with standard practice. The cam **38** operates the double throw cam switch **48** which in turn controls the red and green lights **50** and **52** respectively. Since the construction and operation of the mechanism for controlling the operation of the red, green and amber lights at the intersection is of standard construction, no further description of this apparatus is is considered necessary.

The cam **40**, which is mounted on the same shaft as cams **36** and **38** and which consequently rotates in synchronism with the cams **36** and **38**, is used for controlling a series of double throw cam switches **54**, **56**, **58**, **60**, **62** and **64** which control the operation of the red and green cue light units **66**, **68**, **70**, **72**, **74** and **76** respectively. In order to simplify the description, the cue lights for only two of the approaches to the intersection have been shown in Figure 3. The cue lights for the other two approaches would be connected in parallel with the cue lights shown. It will be noted from the above described arrangement that the arrangement of the cam operated switches with respect to the cam **40** is such that successive cue lights are successively lit along the highway in a predetermined sequence and in a predetermined phase relationship to the stop and go lights at the intersection. After the cue light nearest the traffic signal turns green, the traffic signal also turns green. Thus, traffic which follows the green cue lights will approach the traffic light at the go signal.

At normal intersections the cue lights mounted along one highway will operate in synchronism with the cue lights mounted along the intersecting highway except that when one of the cue lights along the one highway is green, the correspondingly located cue light on the other highway will obviously indicate red.

In order to attract the attention of the motorist to the presence of the cue lights, a special blinker means has been incorporated. This blinker means comprises a gear **84** which is driven from the cam shaft **35**. The gear **84** drives a small gear **86** which causes periodic tilting of the mercury switch **88** through the pivoted links **90** and **92**. The link **92** has its one end pivotally supported on a fixed pivot pin **94** so that as the gear **86** rotates, the mercury switch **88** will be tilted in such a manner as to cut the resistance element **96** into and out of the circuit leading to the cue lights.

In the circuit diagram shown in Figure 3, the arrangement of the switches indicates that the traffic light has just turned red on the highway leading to the right and the first cue light or the cue light farthest from the intersection on this same highway has turned green. As the time passes, additional ones of the cue lights will turn green, so that a driver opposite the light **66** seeing that light green and the lights ahead of him red will know that he should not drive too fast or he will overtake the red cue lights and will reach the intersection before the go light comes on. Likewise, if a driver while opposite the cue light **68** observes that the cue light **66** is red and the cue light **68** has just turned red but that the cue light **70** is still green, he can by traveling fast enough reach the subsequent cue lights before they turn red and can consequently arrive at the intersection when the light is still green.

In Figure 2 of the drawings, I have shown an arrangement somewhat similar to the arrangement in Figure 1, but in place of providing a large number of individual pairs of red and green cue lights without any speed rates indicated thereon, this figure shows an arrangement in which the same number of pairs of cue lights are provided but in which the pairs of cue lights are grouped together in groups of three and mounted in a housing **69** mounted on a post **71** beside the highway, as shown in greater detail in Figure 6. Adjacent each set of cue lights there is provided a number which designates the recommended rate of speed to travel for reaching the intersection when the light is green. The mechanism for operating these cue lights would be similar to the mechanism used for operating the cue lights shown in Figure 1 of the drawings. The timing for these cue lights can be varied by varying the setting of the cam operated switches as explained hereinafter.

In Figure 4 of the drawings, I have shown in greater detail an illustrative arrangement which makes it possible to adjust the position of the cam followers of a particular cam operated switch mechanism, so as to adjust the individual timing of the switches to meet traffic conditions. As shown herein, the switches **64**, **62** and **60** may be adjustably mounted on a fixed supporting plate **91** which is provided with a series of slots

93 as shown. The position of each switch on the plate may be adjusted by loosening the screw 95 which holds the switch in adjustment.

Again referring to Figure 5 of the drawings wherein I have shown in detail a single speed indicating sign 89 for use in a system in which several cue lights are mounted together in a single housing, as shown in Figures 2 and 6, and in which numbers indicating the recommended speed have been placed adjacent each set of cue lights, it will be observed that the arrangement is such that if one approaches the intersection at one given time, the green lights opposite the numbers 30 and 45 and the red light opposite 20, may, for example, be energized, thereby indicating that one should travel between 30 and 45 miles per hour in order to reach the intersection when the light is green. The switches 55, 57 and 59, which are used for controlling these lights, are operated by the cam 49a which corresponds to the cam 49 shown in Figure 3. Additional cams would be used for each set of speed indicating signs 89, but in order to simplify this disclosure, only the one set has been shown, as anyone skilled in the art could easily add additional sets.

All of the primary controller cams are driven from the same cam shaft and are thus synchronized with the traffic light arranged at the intersection. The speeds indicated opposite the green lights are the correct speeds to be used, whereas the speeds opposite the red lights indicate the speeds which should not be used if one wishes to reach the intersection when the light is green. Under certain conditions one may, for example, have a choice between speeds of 20 or 45 miles per hour or some such similar choice.

Figure 6 of the drawings shows a preferred arrangement of the lights and nomenclature to be used in each indicator unit. However, it is to be understood that other arrangements could be used insofar as certain aspects of applicant's invention are concerned. The speeds indicated are used for purposes of illustration only.

In Figure 7 of the drawings, there is shown a refinement of the speed controller sign which provides continuously changing approach speed rate information. In this modification reference numeral 100 designates a conventional constant speed timing motor which operates the traffic light control cams 101 and 102 through a gear reduction mechanism 104. The cams 101 and 102 operate the traffic light control switches 105 and 106 which correspond to the switches 44 and 46 shown in Figure 3 of the drawings. The cam 102 is mounted directly on the main shaft 108 which also drives a selsyn transmitter 110. The selsyn transmitter 110 is electrically connected to a complementary selsyn motor 112 which may be located at a distance from the intersection and which will serve to operate the drive shaft 114 in synchronism with operation of the drive shaft 108. The transmitter 110 and motor 112 are energized from the main power lines 113 and 115 as shown. Selsyn systems of this type are well-known in the art and need no further description.

The shaft 114 is provided with a pulley 116 which in turn drives an endless belt 118. An idling pulley 120 helps to support the endless belt opposite the window 122 in the indicator housing 124. The belt 118 is provided with suitable speed indicia which serve to indicate to the motorist driving along the highway the permissible range of speed which should be adhered to in order to approach the intersection when the light is green. The arrangement is such that a motorist may travel at any of the speeds given on that portion of the belt which is visible through the window at any one time.

It is recognized that traffic approaching a controlled intersection should not travel at excessive speeds and it is likewise recognized that it is not practical to have the traffic approach the intersection at the slowest possible speed and consequently it is desirable to so construct and arrange the speed indicators so as to avoid these objectionable extremes in speed, even though these extremes would allow the motorist to reach the intersection when the light is green. Consequently, it is preferable to design the speed indicators in such a manner that only the more practical speeds are recommended.

The arrangement in Figure 7 illustrates one way in which it is possible to avoid using such objectionable speeds. In referring to Figure 7, it will be observed that a short length of the endless belt has been blanked out. Inasmuch as the light remains green for an appreciable time, it is obvous that a driver approaching the intersection will be allowed a certain amount of latitude in his speed and yet strike a green light. It is also obvious that there will be times when he will be required to either travel at a high rate of speed, such as 45 or 50 miles an hour, in order to reach the intersection when the light is green or to travel at a much lower speed, such as 15 or 20 miles an hour, so as to allow time for the light to change from green to red and back to green. Since it is desirable to keep the traffic moving at a fair rate of speed at all times and to have a maximum number of cars pass the intersection on each green light, it is not practical to suggest to a driver that he should drive only 15 miles an hour while approaching the intersection even though by so doing he would still reach the intersection just before the light turns red. Motorists who drive slower than necessary when approaching the intersection hold up others behind them who want to make the same light but who cannot make the light if they have to stay behind a driver traveling at a speed just fast enough to reach the intersection the instant before the light changes to red. Consequently the endless belt is provided with a blank zone 126 which contains no speed indicia. This blank zone represents a speed which would either be in excess of the safe speed limit or would be too slow for efficient handling of the traffic. That portion of the belt which is not visible through the window 122 of Figure 7 has speed values between 20 and 45 given thereon. The exact speed values used may be varied. For purposes of illustration, I have chosen to indicate speed in equal increments of 5, so that the numbers on the hidden part of the belt are 25, 30, 35 and 40. Since the distance traveled in a given period of time varies with different speeds, it is obvious that the spacing of the numbers on the belt would not be uniform if the speed increments used are equal.

In order to avoid needless complications and needless repetition in describing the construction and operation of the modification shown in Figures 7 and 8, only the one speed indicator has been shown, whereas in actual practice additional speed indicators would be provided. Thus, at least one speed indicator would be located adjacent each approach to the intersection. While one such indicator spaced at a distance from the in-

tersection would serve the purpose, two or more such indicators spaced from one another would better indicate to the driver the recommended speed over a longer section of the highway.

Slippage between the belt 118 and the drive pulley 116 may be prevented by using any conventional type of positive drive connection between the pulley 116 and the belt 118. For purposes of illustration I have shown the pulley 116 provided with pins 130 for engaging the holes 132 provided in the one edge of the belt as shown.

Certain aspects of my invention are equally applicable to an indicator in which the endless belt is eliminated and a large drum (not shown) is substituted for the pulley 116. The recommended speeds would then be shown directly on the periphery of the drum.

The selsyn transmitter 110 and its complementary selsyn motor 112 are conventional self-synchronizing untis which are now well-known in the art and which need no further description. These units 110 and 112 insure operation of the endless belt 118 in a predetermined synchronized relationship to the operation of the stop and go lights 14 located at the intersection of the highways. A speed change gear unit 134 is provided for stepping up the speed of the pulley 116 so that the operation of the belt will be timed properly with the operation of the lights at the intersection.

The operation of each of the speed indicating means described herein and the arrangement of the speed indicia thereon would, of course, be designed so as to be synchronized with the stop and go lights at the intersection in such a manner as to take into consideration the distance from the indicator to the intersection.

The system of indicating recommended speeds groups the traffic into platoons, the apparatus for controlling the recommended speeds operating cyclically, so that the minimum speed is indicated to the advance traffic of a group or a platoon and the maximum speed is indicated to the trailing traffic of the same group or platoon, thereby bunching the traffic as it approaches the intersection.

It is recognized that attempts have previously been made to provide devices designed to inform motorists approaching an intersection what percentage of the stop or go period indicated by the control light has elapsed, but such devices which consider time only and not distance to be traveled do not give the motorist adequate information to accurately determine the speed one should travel over any great distance in order to reach the intersection when the light indicates "go." Since not all stop and go lights are timed alike, any indicator which merely indicates to a driver the percentage of the cycle left becomes more or less meaningless. Furthermore, indicators of this type are located at the intersection and give the same kind of indication to all motorists irrespective of their distance from the intersection. By virtue of applicant's improved arrangement, the motorists approaching an intersection is not only given advance notice of the presence of a stop and go light at the intersection but is given explicit instructions as to how fast to drive the distance from the speed indicator to the intersection in order to reach the intersection at the right time to avoid the need for stopping.

Although the preferred embodiment of the device has been described, it will be understood that within the purview of this invention various changes may be made in the form, details, proportion and arrangement of parts, the combination thereof and mode of operation, which generally stated consist in a device capable of carrying out the objects set forth, as disclosed and defined in the appended claims.

Having thus described my invention, I claim:

1. A speed guide for use in indicating the speed to be traveled on a highway while approaching an intersection having stop and go lights comprising a speed indicating means mounted adjacent the highway at the approaches to the intersection to be viewed by persons traveling over the highway, a series of indicia on said indicating means, each designating a particular speed, a timer operating continuously through a complete cycle of operation, first means operated by said timer for controlling the operation of said stop and go lights, and second means operated by said timer for controlling said speed indicating means in synchronism with said stop and go lights.

2. In apparatus for controlling the flow of traffic at the intersection of two or more highways, the combination, stop and go signal means, a speed indicator mounted at a station adjacent one of said highways to be viewed by persons traveling over said one highway, a series of indicia on said speed indicator at said station, each indicia designating a particular speed, a timer including a series of timer contacts, and circuit means connecting said stop and go signal means, said connecting means connecting in seriatim said series of the indicia of said speed indicator to said timer contacts whereby said series of speed indicia is operated in synchronism with said stop and go signal means.

3. In a traffic regulating system for use in controlling the flow of traffic past an intersection comprising in combination, traffic control signal means at the intersection, variable speed indicating means for giving a recommended speed which is a function of distance and the time available to reach the intersection when the signal at the intersection indicates "go," said speed indicating means being spaced from said intersection along the highway approaching the intersection, and means for synchronizing the operation of said speed indicating means with the operation of said control signal means.

4. In a traffic regulating system for use in controlling the flow of traffic past an intersection comprising in combination, traffic control signal means at the intersection, speed indicating means spaced from said intersection along the highway approaching the intersection, and means for synchronizing the operation of said speed indicating means with the operation of said control signal means, said last named means comprising a first motor for operating said traffic control signal means, a second motor for operating said speed indicating means, and means for synchronizing the operation of said motors, whereby the speed indicated by said indicating means bears a direct relationship to the operation of said traffic control signal means.

5. In an apparatus for controlling the flow of traffic at an intersection of two or more highways, stop and go signal means of the type in which traffic is allowed to cross the intersection on only one highway at a time, speed indicating means mounted to be viewed by persons traveling over one of said highways including a plurality of numbered means for cyclically indicating recommended speeds in terms of miles per hour, and means for operating said speed indicating means in synchronism with said stop and go signal means.

6. In an apparatus for controlling the flow of traffic at an intersection of two or more highways, stop and go traffic control lights, a motor, switch means for controlling said lights, and means operated by said motor for periodically opening and closing said switch means, a selsyn transmitter drivingly connected to said motor, a selsyn motor mounted remotely from said transmitter at a point along said one highway, and speed indicating means operated by said selsyn motor whereby said speed indicating means is synchronized with the operation of said traffic control lights.

7. In an apparatus for controlling the flow of traffic at an intersection of two or more highways, stop and go traffic control lights, a motor, switch means for controlling said lights, and means operated by said motor for periodically opening and closing said switch means, a selsyn transmitter drivingly connected to said motor, a selsyn motor mounted remotely from said transmitter at a point along said one highway, and speed indicating means operated by said selsyn motor whereby said speed indicating means is synchronized with the operation of said traffic control lights, said speed indicating means comprising an endless belt, means for concealing portions of said belt, and speed indicia on said belt.

8. In a traffic control system for use at a highway intersection, the combination, stop and go signal means, speed indicating light means arranged at the approaches to said intersection, first means for periodically energizing said light means, and second means for causing flashing of said light means during the on point of said light means.

9. In a traffic control system for use at a highway intersection, the combination, stop and go signal means including a timing motor and switches operated thereby in a predetermined sequence for establishing stop and go periods, a selsyn transmitter drivingly connected to said motor, a selsyn motor, endless belt means driven by said selsyn motor, and speed indicating indicia on said endless belt, a portion of said endless belt having no speeds designated thereon.

10. In apparatus for scheduling the approach of motorists to an intersection of two or more highways so as to prevent motorists who approach the intersection on different highways from reaching the intersection at the same time, first means for regulating the speed of traffic on a first one of said highways, second means for regulating the speed on a second of said highways, and means for synchronizing the operation of said first and second named means whereby motorists traveling on said first and second named highways will not reach the highways simultaneously, said first and second named means comprising variable means for indicating recommended speed rates in terms of miles per hour for grouping the traffic, said variable speed means operating cyclically so as to indicate the minimum speed for advance traffic of a group and the maximum speed for the trailing traffic of the same group.

11. In apparatus for scheduling the approach of motorists to an intersection of two or more highways so as to prevent motorists who approach the intersection on different highways from reaching the intersection at the same time, first means for regulating the speed of traffic on a first one of said highways, second means for regulating the speed on a second of said highways, and means for synchronizing the operation of said first and second named means whereby motorists traveling on said first and second named highways will not reach the highways simultaneously, said speed regulating means including means for indicating to the motorists in terms of miles per hour a minimum and a maximum permissible speed to be traveled while approaching the intersection, said last mentioned means grouping the traffic into platoons, the minimum speed being indicated to the advance traffic of the platoon and the maximum speed being indicated to the trailing traffic of the platoon to thereby group the traffic.

12. Means for regulating the speed of traffic approaching an intersection of two or more highways, comprising in combination, a first speed indicating means visible to motorists traveling on a first of said highways for indicating to motorists on said first highway the speed to travel when approaching said intersection, a second speed indicating means visible to motorists traveling on a second of said highways for indicating to motorists on said second highway the speed to travel when approaching said intersection, each of said speed indicating means indicating a minimum and a maximum speed cyclically so as to group the traffic into platoons, the minimum speed being indicated to the advance traffic of a group and the maximum speed being indicated to the trailing traffic of the group so as to cause the traffic to be bunched upon reaching the intersection and means for synchronizing the operation of said first and second speed indicating means whereby motorists traveling on intersecting highways will not be scheduled to reach the intersection simultaneously.

13. Means for regulating the speed of traffic approaching an intersection of two or more highways, comprising in combination, a first speed indicating means located along a first of said highways adjacent the approach to said intersection for indicating to motorists on said first highway the speed to travel, a second speed indicating means located along a second of said highways adjacent the approach to said intersection for indicating to motorists on said second highway the speed to travel, and means for synchronizing and staggering the operation of said first and second speed indicating means whereby motorists traveling on intersecting highways will not be scheduled to reach the intersection simultaneously, each of said speed indicating means comprising means for cyclically and selectively indicating a plurality of appropriate speeds, the distance from the intersection to each of said speed indicating means divided by the indicated appropriate speed on one highway resulting in a time period alternating with the corresponding resulting time period on the other highway.

14. In a traffic control system, a speed indicator for use in regulating the speed of traffic over a given section of a highway comprising a housing, a plurality of numbers carried by said housing indicating different speeds to be traveled, light means associated with said numbers and supported by said housing, and means for selectively and cyclically energizing said light means so as to selectively designate different speeds to be traveled.

15. In a traffic control system, a speed indicator for use in regulating the speed of traffic over a given section of a highway comprising a hous-

ing, a plurality of numbers indicating different speeds to be traveled, and means for selectively and cyclically displaying said numbers in a given sequence.

16. In a traffic regulating system for use in controlling the flow of traffic past an intersection comprising in combination, traffic control signal means at the intersection, variable speed indicating means for giving an indication which varies for each cycle of the traffic control means and is a function of the distance and the time available to reach the intersection when the signal at the intersection indicates "go," said speed indicating means being spaced from said intersection along the highway approaching the intersection, and means for synchronizing the operation of said speed indicating means with the operation of said control signal means.

17. In an apparatus for controlling the flow of traffic at an intersection of two or more highways, stop and go signal means of the type in which traffic is allowed to cross the intersection on only one highway at a time, varying speed indicating means mounted to be viewed by persons traveling over one of said highways including a plurality of numbers for selectively and cyclically indicating recommended speeds in terms of miles per hour, and means for operating said speed indicating means in synchronism with said stop and go signal means.

18. In apparatus for scheduling the approach of motorists to an intersection of two or more highways so as to prevent motorists who approach the intersection on different highways from reaching the intersection at the same time, first means for regulating the speed of traffic on a first one of said highways, second means for regulating the speed on a second of said highways, and means for synchronizing the operation of said first and second named means whereby motorists traveling on said first and second named highways will not reach the highways simultaneously, said first and second named means comprising variable means for indicating definite speed rates to be traveled in terms of miles per hour, said variable indicating means operating cyclically so as to group the traffic.

19. In apparatus for scheduling the approach of motorists to an intersection of two or more highways so as to prevent motorists who approach the intersection on different highways from reaching the intersection at the same time, first means for regulating the speed of traffic on a first one of said highways, second means for regulating the speed on a second of said highways, and means for synchronizing the operation of said first and second named means whereby motorists traveling on said first and second named highways will not reach the highways simultaneously, said speed regulating means including variable means for indicating in terms of miles per hour to the motorists a minimum and a maximum permissible speed to be traveled while approaching the intersection, said variable means operating cyclically so as to indicate various recommended speeds for each cycle, which recommended speeds are a function of distance to the intersection and a function of time.

20. A traffic control system for use with a stop and go signal at an intersection, said system including auxiliary cue lights arranged at stations at predetermined intervals along the highway approaching the stop and go lights, the signals of each station including a plurality of indicia each setting forth a recommended rate of speed, the several indicia having speeds graduated from maximum to minimum recommended speed, control means for operating the stop and go signal at the intersection cyclically and alternately, said control means selecting the indicia in order from minimum to maximum speed at each station during each cycle of operation of the stop and go signal to thereby group the traffic so that each group of traffic traveling at the recommended speed arrives at the intersection during the go signal period.

21. A traffic signal system, the combination including a stop and go signal operating alternately and cyclically, means for controlling the stop and go signals, and auxiliary cue signals along the highway at spaced intervals in the vicinity of the stop and go light, said cue signals being grouped at stations, the signals at each station including indicia having several recommended speeds, means for cyclically controlling the stop and go signals, said means including controls for cyclically controlling the cue signals such that the distance from the station to the stop and go signal divided by each recommended rate of speed equals the time falling within the time period that the go signal is energized.

References Cited in the file of this patent

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Number	Name	Date
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