R. E. WETTER.

TRAFFIC SIGNAL SYSTEM.

APPLICATION FILED NOV. 23, 1918.

1,385,807.

Patented July 26, 1921.

5 SHEETS—SHEET 1.

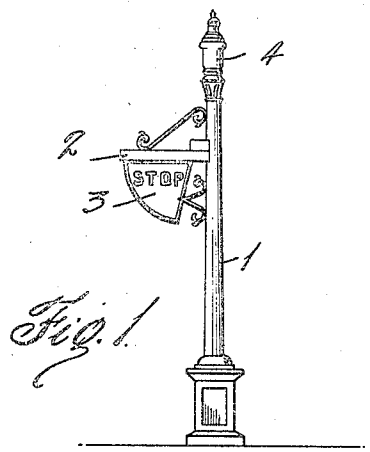
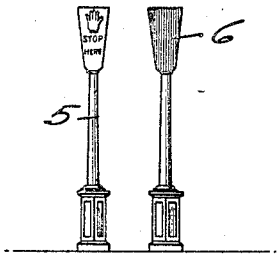


Fig. 1.

Fig. 2.



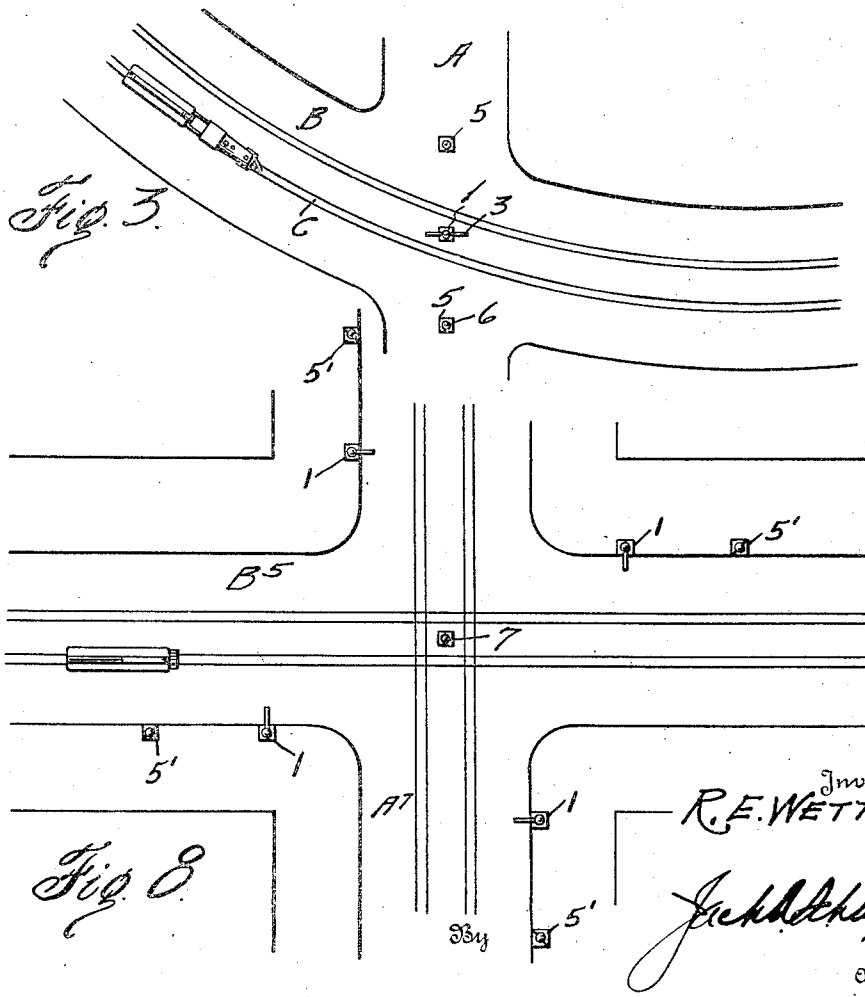


Fig. 3.

Fig. 8.

Inventor

R. E. WETTER.

By

Attorney

R. E. WETTER.

TRAFFIC SIGNAL SYSTEM.

APPLICATION FILED NOV. 23, 1918.

1,385,807.

Patented July 26, 1921.

5 SHEETS—SHEET 2.

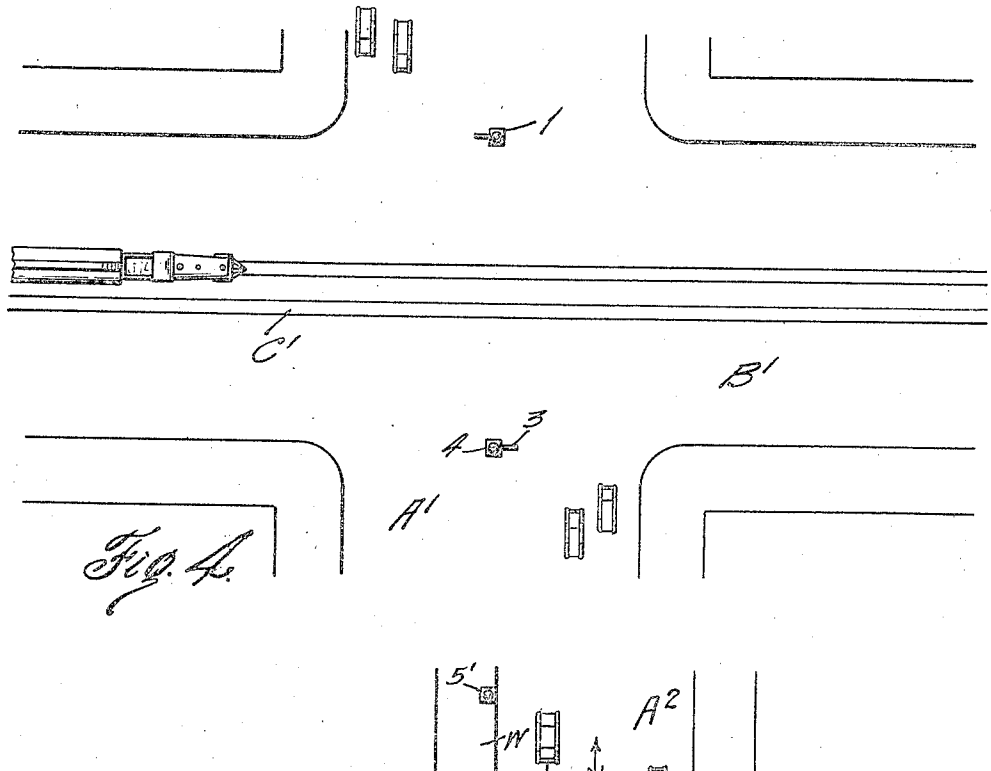


Fig. 4.

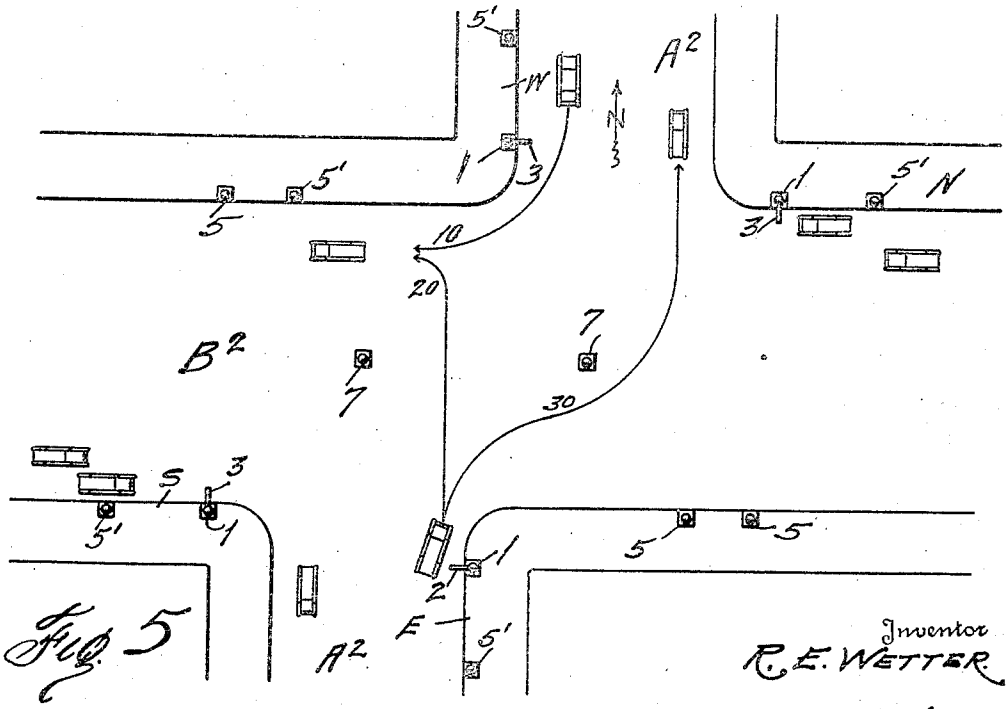


Fig. 5

Inventor

R. E. WETTER.

By

Jacket Schley

Attorney

R. E. WETTER.

TRAFFIC SIGNAL SYSTEM.

APPLICATION FILED NOV. 23, 1918.

1,385,807.

Patented July 26, 1921.

5 SHEETS—SHEET 3.

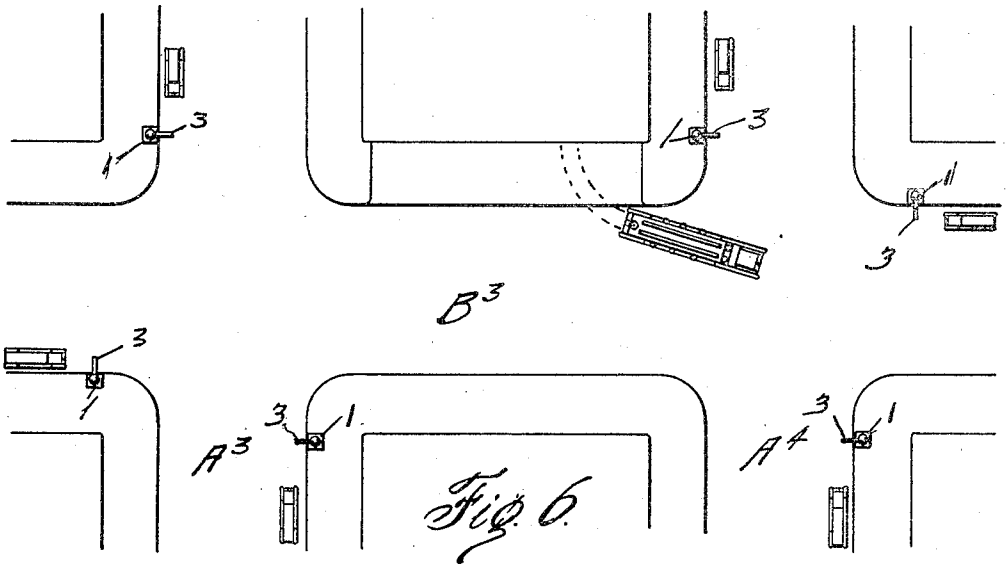


Fig. 6.

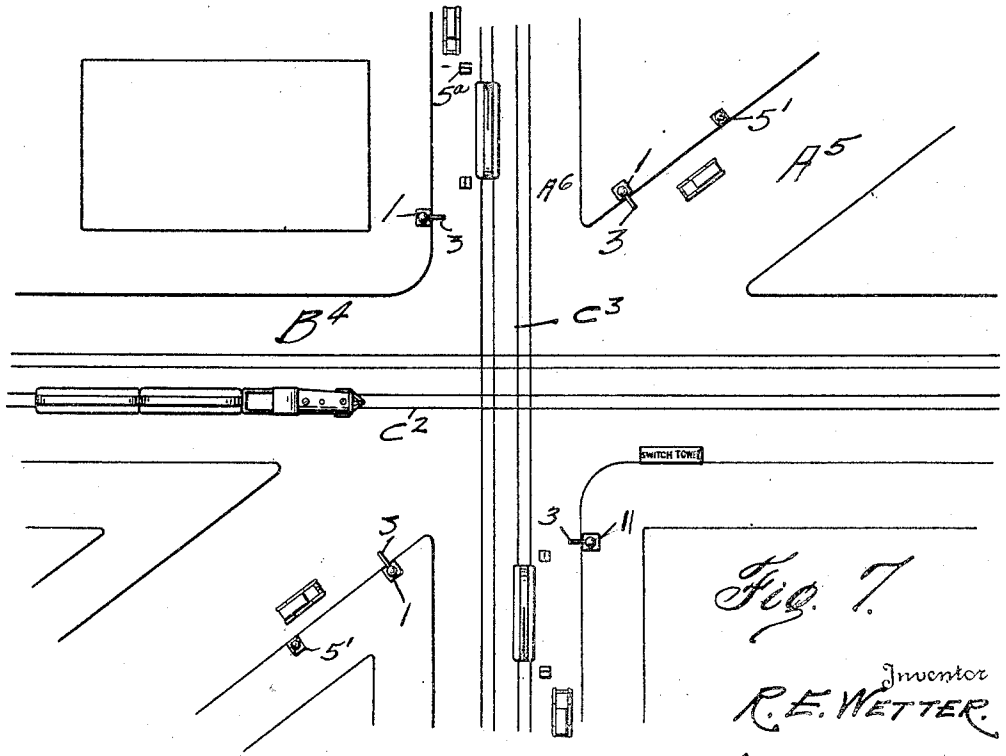


Fig. 7.

Inventor

R. E. WETTER.

By Jack M. Ashley

Attorney

R. E. WETTER.

TRAFFIC SIGNAL SYSTEM.

APPLICATION FILED NOV. 23, 1918.

1,385,807.

Patented July 26, 1921.

5 SHEETS—SHEET 4.

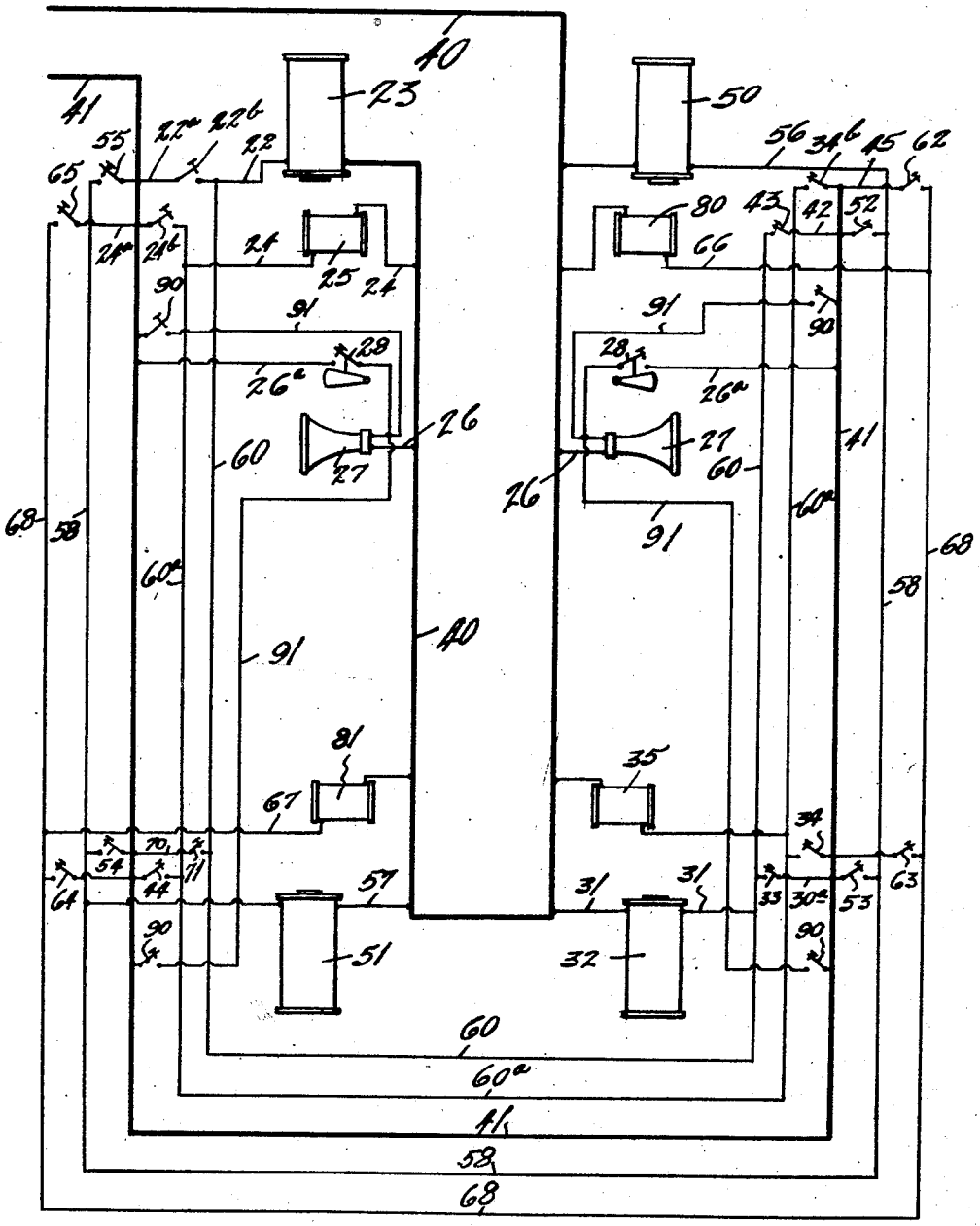


Fig. 9.

Inventor

R. E. WETTER

By Jacks & Ashley

Attorney

R. E. WETTER.

TRAFFIC SIGNAL SYSTEM.

APPLICATION FILED NOV. 23, 1918.

1,385,807.

Patented July 26, 1921.

5 SHEETS—SHEET 5.

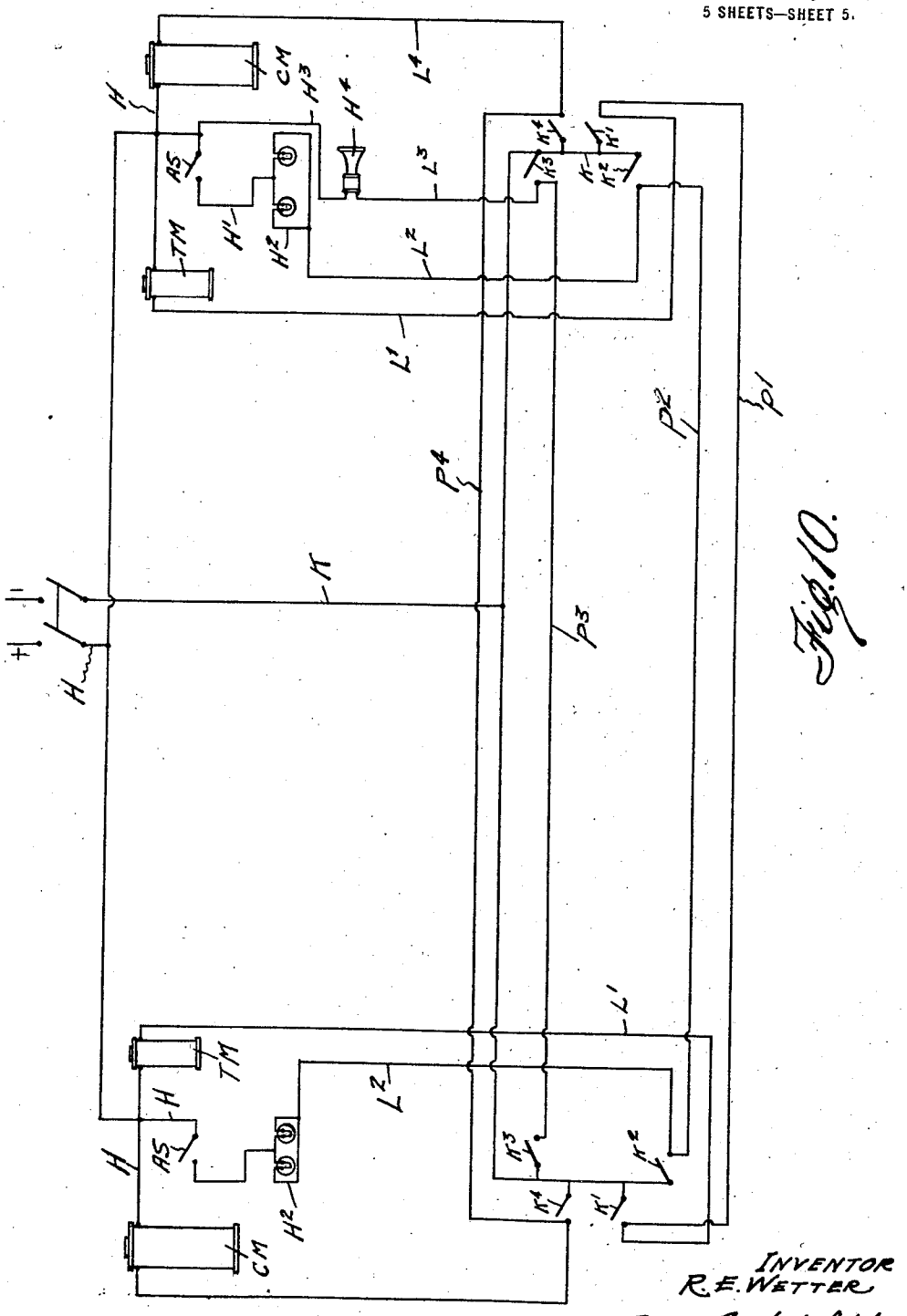


Fig. 10.

INVENTOR
R. E. WETTER
By Jackson & Ashley
ATTORNEY.

UNITED STATES PATENT OFFICE.

RALPH E. WETTER, OF DALLAS, TEXAS, ASSIGNOR TO UNIVERSAL TRAFFIC CONTROL COMPANY, (A TRUST ESTATE), OF DALLAS, TEXAS.

TRAFFIC SIGNAL SYSTEM.

1,385,807. Specification of Letters Patent. Patented July 26, 1921.

Application filed November 23, 1918. Serial No. 263,916.

To all whom it may concern:

Be it known that I, RALPH E. WETTER, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Traffic Signal Systems, of which the following is a specification.

This invention relates to new and useful improvements in systems for controlling street and highway traffic.

The invention contemplates a universal signal system which may be used in connection with the various phases of traffic such as automobile, vehicle, street car, railway and pedestrian traffic. The particular aim of the invention is to create a safety zone at or adjacent the crossing of the various phases of traffic. It will be apparent that a traffic or warning signal to be universal must be applicable and universal under all conditions.

The invention therefore resides in a system for controlling traffic and involves the use of a universal signal capable of universal use. It is obvious that various kinds of crossings with numerous variations will be encountered and it would be impossible to illustrate or describe such; however, I have worked out a system which I believe will meet the conditions imposed at any crossing, intersection or approach and perform the functions in a satisfactory manner.

The system includes a traffic warning signal to indicate danger and create a safety zone, either with or without auxiliary signal elements. It is pointed out that the invention is not limited to the particular structure of the signal elements and involves structure only in so far as the general construction of the signal coöperates with the system.

In general the system includes a visual as well as an audible signal and involves the use of a signal pole or support carrying one or more normally dormant or inactive signals arranged to be displayed or brought into operation when traffic is to be controlled, together with a suitable audible signal coöperating therewith. The signal pole may be located at various points and a multiplicity of such poles may be used according to the formation and conditions existing at the crossing. The signal may be electrically, mechanically or manually operated and its operation initiated either manually or automatically. The signal may be used with reservation signals or neutral poles as the conditions may require.

A neutral pole may be advantageously used in some instances in connection with the signal as a guide to direct the moving traffic. The term "safety zone" is used in this specification to designate a restricted area in which vehicles, common carriers and pedestrains will be safe from the intersecting or crossing line of traffic.

The system also provides for cases of emergency in which it is necessary to stop all traffic and give right-of-way to fire engines, ambulances and the like. In such instances the audible signal plays quite an important part but of course acts in harmony with the visual signal.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is illustrated, and wherein—

Figure 1 is a view of a typical signal pole and signal which can be used with my system.

Fig. 2 shows reverse views of a reservation pole,

Fig. 3 illustrates the signal installation at a street and railway crossing,

Fig. 4 shows a different installation at a similar crossing,

Fig. 5 illustrates an offset street crossing and the signal installation for the same,

Fig. 6 illustrates the use of the system for controlling traffic in cases of emergency where it is necessary to give the right-of-way to fire engines and the like,

Fig. 7 illustrates the system as applied to a three-way crossing,

Fig. 8 illustrates a street crossing with intersecting street car lines and the use of a neutral pole,

Fig. 9 is a diagram of the circuits employed for operating a plurality of signals in pairs from either signal of a pair, and

Fig. 10 is a diagram of the circuits employed where one or more signals are operated from a master signal.

In the drawings the numeral 1 designates a signal pole which may be suitably con-

structed. Each pole has near its upper end one or more laterally projecting housings 2 into each of which a collapsible signal member 3 of the semaphore type is adapted to swing whereby it is completely concealed in said housings. Where two signals are employed on a single pole the housings project on opposite sides. It is to be understood that the semaphore may be constructed in any suitable manner and further that the system contemplates the use of any suitable signal. If desired a light globe 4 may be installed on top of the pole and suitably illuminated.

Throughout the various illustrations I have shown reservation poles 5 each having a panel 6 at its upper end carrying traffic instructions on either side, for instance the words "Stop here" and the representation of a hand in halting position may be on one side. The visual signal is operated in connection with an audible signal such as a bell, electric horn or the like which may be suitably located and will be hereinafter explained in detail.

In Fig. 3 I have illustrated the intersection of a straight street or highway A and a curved highway B having railway tracks C which cross the street A. At the center of the intersection a signal pole 1 is located with signal devices 3 projecting on opposite sides at substantially right angles to the street A. The pole separates the traffic moving on one side of the street A from that moving on the other side. If a train was approaching on the track C traffic would be immediately stopped on the street A by dropping both of the signals 3. In order to prevent traffic from moving toward the track C beyond a certain point a reservation pole 5 is set at the juncture of the streets A and B on each side of the street B and in line with the pole 1. Each pole would have its panel 6 displayed to the approaching traffic and would bear the words "Stop here." In this instance the reverse side of the panel would be blank. The reservation poles form the extreme limit of the safety zone which is created by the operation of the signals 3. These reservation poles restrain the traffic and hold the same back of the curb line of the street B. Without the reservation poles reckless drivers might approach too close to the track C.

In Fig. 4 I have shown two signal poles located at the crossing of two streets A^1 and B^1 at substantially right angles to each other. These poles are located at about the same point as the reservation poles in Fig. 3 and a railway track C^1 on the street B^1 crosses the intersecting street. Each signal pole 1 has a signal device 3 projecting transversely of the street A^1, and the housing on one pole is placed on the side opposite to the housing on the other so that one signal pole controls the traffic moving in one direction and the other signal pole controls the traffic which moves in the other direction on the opposite side of the street. It will be seen that this particular crossing may be controlled either by the arrangement shown in Fig. 3 or that shown in Fig. 4.

In Fig. 5 I have shown an intersection of two streets or highways in which the street A^2 is offset where it crosses the street B^2. Assuming the street A^2 extends north it will be seen that the sidewalk E of the south portion of the street is almost opposite the sidewalk W of the north portion of said street. In this formation it is desirable to use neutral poles 7 which may be of any suitable structure and these are placed where the center lines of the north and south portions of the street A^2 intersect with the center line of the street B^2. Three routes of travel are shown the same being numbered 10, 20 and 30 respectively. A vehicle moving north would be compelled to take the route 30 in crossing the street B^2 and pass to the right of the eastern neutral pole; but should this vehicle desire to turn west on the street B^2 it would take the route 20 and pass between the neutral poles. Where a vehicle is traveling south and approaching the street B^2 it must take the route 10 if it desires to continue south or west, in the former case passing on the west side of the western neutral pole. The neutral poles direct and separate the traffic.

In connection with the formation shown in Fig. 5 the signal poles 1 are located at the curb of the sidewalks E, S, N and W. On each pole the signal housing is directed transversely of the street. It is preferable to locate each pole in line with the building line of the intersecting street, for instance the pole 1 whose signal controls the traffic passing west on the street B^2 is located in line with the building line running north on the eastern side of the street A^2. This causes the vehicles to stop back of the signal and permits a free passage for pedestrians between the signal and the intersecting street thus permitting pedestrians to use the usual path in crossing the street B^2. This crossing may be defined by a pair of reservation poles 5 placed on the opposite side of the street B^2. It will be seen that the reservation poles will guide pedestrians and keep them from walking diagonally across the street B^2. In Fig. 5 the signals 3 on the sidewalks N and S of the street B^2 are presumed to be in operation for stopping traffic on street B^2 and permitting traffic to move north and south on street A^2, the signals for this street being clear. I have also shown a reservation pole 5′ associated with each signal pole and spaced therefrom at the curb on the same sidewalk. A reserved zone is created in this space so that buses may take on passengers without interference from other vehicles.

Fig. 6 shows the system as applied at street crossings in vicinity of a municipal station from which ambulances, fire engines and police patrols operate. In this particular illustration a street B^3 crosses streets A^3 and A^4, the station being located on the street B^3 between the other two streets. It only is necessary to employ three signal poles at each intersection which are preferably located at the curb so as to overhang the street on which they control traffic. It will be seen that only one signal for the street B^3 will be required at each crossing, but two signals will be required for each of the other streets. The signals may be operated in the usual way to control traffic moving along the street B^3 and each of the streets A^3 and A^4, but in the case of an emergency where some of the apparatus from the station answers a call and must have free passage, traffic in all directions will be halted by the operation of all the signals, and attention will be called to this condition by the operation of the audible signal. In fact each signal installation is arranged for emergency operations, so that traffic may be halted in all directions. This will be obvious from observation of each one of the illustrations.

Fig. 7 shows a street A^5 crossing a right-of-way B^4 diagonally and a street A^6 crossing the right-of-way B^4 at substantially right angles. Railway tracks C^2 are shown on the right-of-way B^4 and street car tracks C^3 are shown on the street A^6 crossing the railway tracks. In this instance there is no traffic on the right-of-way B^4 but there is converging traffic on the streets which intersect at the crossing. Signal poles 1 are shown on opposite sides of the street A^5, one on each side of the crossing. The reservation poles 5′ are also used in this instance. On the street A^6 the signal poles are located one on each side of the crossing on opposite sides of the street; and in this instance reservation poles 5^a are set adjacent the track C^3 to define a space within which pedestrians may freely move to board a street car. The street is warned of the approach of a train by the signal 3 and while it may stop between the reservation poles other vehicle traffic cannot enter the zone created by said poles.

In Fig. 8 I have shown a street A^7 crossing a street B^5 at substantially right angles and signal poles 1 located at the curb line the same as in Figs. 5 and 7. The reservation poles 5′ are also used in this case and create with the signal poles a safety zone back of which the vehicle traffic must stop when the crossing is closed thus permitting passengers to enter a street car or bus. When the signal is inactive this arrangement creates a reserved space at the curb for pedestrians and passengers. A neutral pole 7 is used at this crossing around which the traffic must pass in making turns.

It is pointed out that the location of the signal pole 1 may vary according to crossing conditions, but an advantage may be had by a particular location of the pole. For instance in Figs. 5, 6, 7 and 8 the signal pole is located at the curb line approximately in alinement with the building line of the street crossing the street on which the signal is located. This arrangement creates a safe passage for pedestrians to cross the street on which the pole is located between said pole and the curb line of the intersecting street and in line or parallel with the moving traffic. The halted traffic must stop at the signal pole and thus a safe pedestrian crossing is created between the signal pole and the curb line of the intersecting street. It is not necessary to locate the signal pole exactly on the line with the building line and such location was merely chosen as an illustration.

It will be seen that it is possible to operate the signal in each instance from a safe point and the operator or traffic officer need not stand in the street as the signals may be operated from the sidewalk or a switch tower or other place. While the semaphores 3 may be operated either mechanically or electrically and the operation may be carried out either manually or electrically I prefer to operate the signals by means of electricity and to initiate the operation either manually or automatically.

In Fig. 9 I have shown a diagrammatical view of a circuit such as would be used for operating the signals shown in Figs. 4, 5, 6, 7 and 8. This circuit arrangement is designed to operate the signals in pairs or simultaneously. This arrangement in fact includes two circuits and they are designed to be used in connection with a signal which comprises a swinging semaphore which is suitably released by means of magnets, and is closed or swung upward by means of magnets. It is not considered necessary to go into the details of the signal structure as the same is clearly illustrated in my co-pending application filed January 20, 1919, Serial No. 272,159, Patent No. 1,326,009, issued December 23, 1919.

In the diagram illustrated, 40 and 41 are the main or lead-in wires. From one of these wires 40 extend the branch circuits in which the various operating and adjunct mechanisms are included. Thus from wire 40 extends the branch 22 in which the magnet 23 for operating the mechanisms (not shown) for raising the semaphore arm to inoperative position is included. From wire 40 also extends a branch 24 in which a magnet 25 for operating the signal releasing means (not shown) is connected. The line 24 is connected to line 60^a. The line 60^a is

connected to the line 41 by depressing a push button 24^b. From wire 40 also extends a branch 26 in which an audible signaling device in the form of a horn 27 and a circuit opening and closing device 28 are included.

The branch wire 22 is connected by wire 22^a with line 41 when a push button or similar switch 22^b is operated to close the connection through wire 22^a.

It follows that when push button 24^b is depressed to make the circuit through the release magnet 25 the semaphore arm will descend by gravity to display its stop signal. When, however, the push button 24^b is released, the circuit through the magnets 25 is broken. When the push button 22^b is depressed the circuit through the magnet 23 for raising the semaphore arm is made.

Where diagonally opposite semaphore arms are to be raised and lowered in unison, the various branches are extended to include the various mechanisms for the other semaphore arm.

The branch wire 22 in which the magnet 23 is included, is continued by wire 60. A branch 31 in which a magnet 32 for raising the diagonally disposed semaphore is included, leads from the wire 60 to wire 40. The wire 60 is connected to a second push button 33, and thence by wire 30^a to the return wire 41. It follows that both magnets 23 and 32 may be operated simultaneously by the depression of either push button 22^b or push button 33. Thus when push button 33 is depressed the current flows over wire 31 from wire 40 through the closing magnet 32 to wire 60 and to wire 30^a and wire 41. The current also flows from wire 40 to closing magnet 23 and through wires 22 and 60 to and through the switch 33 and to the wire 41.

The release magnet 25 is similarly connected in multiple with a corresponding release magnet 35 at the diagonally opposite corner and to complete the circuit either push button 24^b or 34 may be depressed and the two signals at diagonally opposite corners may be dropped to block the traffic.

To enable the pairs of signals to be operated from any one of the four corners the line 60 may be connected to a branch 70 leading to return wire 41 by depressing a push button 71. The line 60 is also continued to a push button 43 connected by branch 42 with wire 41 when the push button 43 is depressed. Each corner pole therefore has in its box one of the push buttons 22^b, 71, 33 or 43 which when depressed will bring a pair of semaphores to inoperative position. In a similar manner one of the push buttons 24^b, 44, 34 and 34^b will when depressed operate the release magnets to display the diagonally opposite semaphores in pairs, said push buttons being connected to a wire 60^a.

The operation of the other pair of diagonally disposed closing magnets 50 and 51 by one of the push buttons 52, 53, 54 and 55 at the several corners is accomplished in a similar manner by closing a circuit from wire 40 by branches 56, 57 and line 58 to wire 41, when any one of said push buttons is depressed.

The operation of the other pair of diagonally disposed magnets 80 and 81 by one of the push buttons 62, 63, 64 and 65 at the several corners is accomplished by closing a circuit from wire 40 by branches 66 and 67 and line 68 to wire 41 when the push button selected is depressed.

It is not necessary to provide a horn for each signal pole as one horn will be ample for each pair of signals. The horns are arranged in such a manner that the traffic will be warned by a horn blast when the semaphore signal is lowered and when it is raised. The arrangement of the horn may be such that one blast may be given to stop the traffic when the semaphore is lowered or displayed and two blasts may be given when the semaphore is raised or drawn into the housing 2. This arrangement may be varied. For operating the horn continuously a fifth push button 90 may be placed in at each pole and connected with wire 41. A wire 91 leads from each push button to the wire 26 of one of the horns.

In case of an emergency, traffic may be instantly stopped by operating all four of the signals and if desired the horn could be operated continuously.

In Fig. 10 I have shown a circuit diagram in which one or more signals may be operated from a master signal. A wire H forming one side of the lead in circuit has its branches leading to the tripping magnet TM and the closing magnet CM, as well as to the automatic switch AS. This wire H not only leads to the master signal but each of the signals controlled thereby. The other pole of each automatic switch is connected by a wire H^1 with a lamp loop H^2. In the master signal the electric siren H^4 is connected with the circuit wire H by a branch wire H^3. The function of the magnets, siren and lamps have been heretofore explained and a repetition is considered unnecessary.

The other side of the main circuit is formed by a wire K. Branches of this wire lead to one of the poles of a series of four switches K^1, K^2, K^3 and K^4 respectively for each signal. The other pole of the switch K^1 at each signal is connected with the tripping magnet by a wire L^1 which completes the circuit through the magnet. These poles also are connected with each other by a wire P^1. It will be seen that by closing the switch K^1 the circuit through the tripping magnet of the master signal will be closed

over the wire L^1 whereby the signal will be operated. The circuit at the same time will be closed over the wire P^1 to the open pole of the switch K^1 of the other signal whereby the tripping magnet of said signal will be operated by the closing of the circuit over the wire L^1 thereof. It will be seen that the operation of the switch K^1 at any one of the signals will operate the tripping magnet of each of the other signals and there may be any number of signals. In practice, however, the operation will probably be performed from one switch. The open pole of each switch K^2 is connected with the lamp H^2 by means of a wire loop L^2 so that by closing said switch at the master signal the lamp circuits are closed and controlled by the automatic switches AS. The automatic switches are of suitable structure and are arranged to illuminate the lamps when the signal is displayed and turn them off when the signal is withdrawn.

As there is but one siren, this is located at the master signal and connected with the switch K^3 by means of a wire L^3, although the pole is provided at the other signals so that a siren could be installed if desired and operated in common with the siren H^4; the open poles of the switches K^3 being connected by a wire P^3. The open pole of each switch K^4 is connected by means of a wire L^4 with a closing magnet CM of the signal and each of said poles is connected by a wire P^4. Thus when one of the switches K^4 is closed the closing magnets are operated and the signals withdrawn. It is obvious that two signals may be mounted on separate poles or on the same pole. It is also obvious that switches might easily be omitted from all of the signals except the master signal, and this single set of switches could be located either on the pole or at some other point. It is preferable to have but one setof switches where two signals are mounted on the same pole.

What I claim is,

1. In a traffic control system, the combination with a signal pole having electrically controlled signals located at a street corner, and a companion signal pole placed apart from the first signal pole.

2. In a traffic control system, the combination with a signal pole adapted to control vehicular traffic, and a second signal pole associated with the first signal pole and spaced therefrom for designating zones relatively to the first signal pole.

3. In a traffic control system, the combination with a semaphore pole with signal means placed at each corner of a street intersection, and provided with means for operating the signal means from each of the other semaphores so that a traffic officer may stand at any of the semaphores and control the traffic, the semaphore being located at a point intended for stopping common carriers even therewith which will permit pedestrians to cross the street or highway in front of said common carriers, a reservation pole spaced apart from the semaphore pole a distance approximately the length of the common carrier, say a street car, so that a safety zone is formed between the reservation pole and the semaphore to permit pedestrians to safely pass to and from the sidewalk and the car.

4. In a traffic control system, the combination with a signal pole with electrically controlled signals located at a street corner, a companion pole placed apart from the signal pole to stop traffic a distance from the signal pole, and a safety zone reserved between the companion pole and the building line of the intersecting street or highway for the protection of pedestrians from vehicular traffic.

5. In a traffic control system, a semaphore located at a traffic way intersection, a reservation pole spaced apart from the semaphore, an order directory of traffic on the semaphore adapted to be displayed or concealed, and an unchanging traffic order on the reservation pole for the purpose of causing the traffic to stop even with said pole.

In testimony whereof I affix my signature.

RALPH E. WETTER.