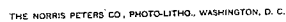


### Railroad Telegraphic Signal.

Patented Feb. 17, 1857.



# UNITED STATES PATENT OFFICE.

WILLIAM D. WESSON, OF CHILLICOTHE, OHIO.

## IMPROVEMENT IN ELECTRIC TELEGRAPHS.

Specification forming part of Letters Patent No. 16,665, dated February 17, 1857.

*To all whom it may concern:*

Be it known that I, WILLIAM D. WESSON, of the city of Chillicothe, in the county of Ross and State of Ohio, have invented certain new and useful Improvements in Electric Telegraphs, by which they are adapted for use under locomotive conditions; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal elevation of a portion of a telegraph, showing its adaptation, by my invention, to communicate to or from a train while stationary or in motion. Fig. 2 is a transverse elevation of the same. Fig. 3 is a detail view of part of the same. Figs. 4, 5, 6, and 7 are views representing modifications of some of the details of the telegraph. Fig. 8 is a side view, on a small scale, of a complete telegraph-line of the construction represented in Figs. 1, 2, 3, exhibiting the batteries, the instruments, and the terminal ground-plates.

Similar letters of reference indicate corresponding parts in the several figures.

The object of my invention is to adapt the electric telegraph in all its various characters, as designated "electro-magnetic," "electro-chemical," &c., in an effective manner to transmit telegraphic communications between railroad-trains, canal-boats, and other vehicles which move in an unvarying or but little varying track or route, and stationary points at greater or less distances, or between all such vehicles, either while the said vehicles are stationary or in motion.

The general principle of my invention consists in the construction of a complete stationary telegraph-line along the route to be traveled by the vehicle, in such manner that its circuit may be broken at regular intervals by the passage of the vehicle along the route, and in furnishing the vehicle or vehicles running along the route with a telegraphing-instrument and suitable means of effecting a continual connection from the said apparatus to the stationary line at opposite sides of such point therein as the circuit may be broken at, by the device carried by the vehicle for that purpose, thereby causing the circuit to be completed through the vehicle or vehicles.

To enable others skilled in the art to make

and use my invention, I will proceed first to describe with reference to the drawings the details of its construction in that mode which I consider the best, and the operation thereof, and will then explain briefly some modifications.

To facilitate the explanation I will define the meaning of some terms that will be found in the description. By the term "vehicle" is meant either a railroad car or train, a canal-boat, or any other body moving on a definite route of travel. The term "outside line" is meant to embrace everything outside the vehicle, necessary for the proper conduction and insulation of a galvanic or telegraph circuit. The term "inside line" is meant to embrace all the connections and other parts of the circuit carried by the vehicle or vehicles, and the term "telegraphy" is intended to include all the fixtures and apparatus usually employed in telegraph offices for the purpose of transmitting and receiving intelligence.

The outside line is composed of immovable and movable conductors, the immovable conductors being arranged so that by the interposition and contact of the movable conductors a perfectly continuous conductor, like that of an ordinary unbroken conducting-wire, is produced, and the movable conductors being so applied that they may be used to break the direct circuit through the outside line to enable it to be completed through the inside line to enable communication to be carried on between all vehicles on the track or other route of travel each with another, and with stationary offices upon or remote from the route of travel. To construct this outside line a row or line of equidistant posts, A A, or other equivalent supports, is erected along the track or other route of travel, longitudinally parallel therewith. To the side of each of these posts nearest the track are attached two horizontal arms, B B, (see Fig. 2,) extending rectangularly toward the track. To the ends of these arms are firmly secured boards or metal plates C C, to each of which is attached, by a pivot, *a*, one of a pair of metal elbows, D D, which are insulated from the boards or plates C C at their pivots *a a*. These elbows are only allowed a slight amount of play on their pivots, their motion being limited between pins *b c*, which are also insulated, and the elbows never touch each other. Each elbow is connected

with the nearest elbow on the next post or standard by one of a series of iron conducting-wires, E E, two elbows thus connected and the connecting-wire constituting one of the immovable conductors of the outside line. The connection of the conducting-wire with the elbows is made by passing the end of the wire through a groove, *d*, (see Fig. 2,) in the bottom of the elbow, and then upward and through a hole in the elbow, as shown at *e*, Fig. 1, by which method of connection the weight of the conducting-wires, acting in catenary curves, is made to draw the upper ends of the two elbows of each immovable conductor toward those of the next stationary conductor or those which are respectively carried by the same posts.

It will be observed, on reference to Figs. 1 and 2, that the conducting-wires E E are represented as being fringed with fine iron wires *ff*, which hang so as to be capable of vibrating freely backward and forward. This is to suit the particular construction of what are termed the "circuit-receivers" of the inside line that is shown in those figures, as will be hereinafter described; but with other constructions of the circuit-receivers, hereinafter specified, plain wires only will be required for the conductors of the outside line.

To the part of each post A above the arms B B is attached a bracket or frame-work, F, of wood or other material, to carry a shaft, G, which stands out horizontally over and at right angles to the track. This shaft has a crank, *g*, from which is suspended, by a link, *h*, a rod, *i*, which works in guides and has at its bottom a wedge-shaped piece of metal, H, which enters between the upper parts of the two elbows D D attached to the posts, the upper parts of the said elbows being beveled to fit the piece H. The rod *i* is fitted with a spring, *j*, which tends to press down the piece H between and into contact with the beveled parts of the elbows, in which condition it closes the circuit between two immovable conductors. The above action of the spring *j* is, however, limited by the crank *g*, which, on its arrival at a vertical position below the shaft, prevents the farther descent of the piece H, but the peculiar mode of connecting the conducting-wires E E with the elbows D D draws them toward the piece H with an elastic pressure, which makes the said elbows adapt themselves to a proper state of contact with the piece H, which constitutes the movable conductor before mentioned, and must be insulated from the post A or from the ground. From the extremity of the shaft G which overhangs or is nearest to the track is suspended a pendulum, I, which hangs in vertical position when the movable conductor is in its lowest position, but which is to be swung forward by what is termed the "circuit-breaker" on the vehicle striking it as the vehicle passes along the track, and thus caused to turn the shaft G far enough for the crank *g* to raise the movable conductor or, as

it may be termed, the "circuit-closer," A, out of contact with the elbows D D, and thus break the circuit in the outside line. The circuit of the outside line is always closed of itself at all points except where a vehicle breaks it, and at that point the circuit is completed through the inside line.

The inside line will now be described.

Near each end of the vehicle V is placed one of two devices, which I term "circuit receivers," of one of which a plain view is given in Fig. 3. These circuit-receivers consist each of a horse shoe electro-magnet, J J, having horizontal iron plates, K K, attached to its poles, and being attached to a horizontal shaft, *l*, which is supported near the cross-bar J', of the magnet by an elliptic spring, *m*, and at the other end by a fixed standard, *n*. The circuit-receivers are to project from the vehicle on the side next the outside line so far that the plates K K will be under the conducting-wires E E, and are to be arranged at such an elevation that the plates will be in contact with the fringe *ff*. A sufficient battery is to be applied to the coils of the magnet of each circuit-receiver to give the magnet the requisite power to insure the adhesion of the fringe of the outside line to the poles of the magnet, in which condition the outside line serves as an armature to the magnet. The object of the spring *m* is to accommodate the circuit-receivers to the swaying motion of the vehicle from whatever cause, so that the fringe may never fail to be in contact with the poles *kk* of the magnets. The shafts *ll* of the circuit-receivers are connected by a conducting-wire, *y*, having a telegraphery in its circuit. Between the two circuit-receivers is placed what I term the "circuit-breaker" L, Figs. 1 and 2, which consists of a stand of wood, metal, or other material having its upper surface horizontal for the greater portion of its length, but inclined downward toward the ends, as shown in Fig. 1. This is placed at such an elevation that its ends will strike the pendulums and as the vehicle passes them, will throw them forward, until the horizontal part of its upper surface arrives under them and holds them in an inclined position, thereby lifting the circuit-closers or movable conductors H out of contact with the stationary conductors of the outside line, as shown in the center of Fig. 1, and holding them in that condition until it passes the pendulums. The pendulums are fitted with rollers, I', at their extremities to reduce their friction on the circuit-breaker. The circuit-breaker should be of such length relatively to the distance between the pendulums or to the length of the several stationary conductors of the outside line that it will come into operation on one pendulum before it leaves the one behind it, and open the circuit of the outside line at a new place before it allows it to close at the place previously opened, and thus keep the circuit of the outside line continually open where the vehicle is passing. The circuit-receivers should be so far apart on the

vehicle that the inside line will extend beyond the entire length of two immovable conductors, so that the circuit may be completed through the inside line as well when the two movable conductors are out of circuit as when only one is so.

It will be understood, without further explanation, that by the above-described devices and contrivances, the galvanic circuit is diverted from a telegraph-line outside of a moving vehicle into a line traveling on such vehicle, and thence out again onto the line outside, thereby enabling the communication to be transmitted from one vehicle to another on the same route of travel, or between a vehicle and any station in the circuit of the outside line, the vehicle or vehicles being in either case either stationary or in motion.

Of the modifications of the apparatus before referred to, one consists in dispensing with the wire fringe *ff* on the conducting-wires *E E*, and the substitution of rollers on the poles of the electro-magnets of the circuit-receivers. This modification is exhibited in Figs. 4 and 5, the former being an elevation of a circuit-receiver thus modified, and the latter a plan of the same. *pp* are the rollers which are fitted to turn freely on journals formed on the poles of the magnet, said rollers being flanged at each end to prevent the wire slipping off. These rollers are held up against the conducting-wire *E* by the elliptic spring *m*, and the wire *E* constitutes an armature to the magnet. In Fig. 1 the plates *CC* are represented as being made with rigid foot-pieces *qq*. These foot-pieces are not necessary when the fringed wire is used, but are intended, under the modification just described, to serve the purpose of bearings for the wheels *pp*, to keep them in a horizontal line corresponding with the height of the conducting-wire while passing the intervals between the elbows *DD*, to which the wires are connected. These foot-pieces *q q* should have each a conductive connection with the elbow on the same plate *C*.

Another modification consists in the use of rigid bars of iron, preferably of flat form, instead of conducting-wires *E E*, such bars being arranged end to end without touching one another, and supported and insulated on arms attached to posts in a substantially similar manner to the arms *B B*, (shown in Fig. 2,) the circuit-closer in this case consisting of a pendulum resting against the bars or against

portions of their supporting-arms in such manner as to close the circuit between the bars when the pendulum hangs free, but to break the circuit when the pendulum is moved back or forth. This modification is illustrated in Figs. 6 and 7, of which the former is a longitudinal elevation of the ends of two bars that are supported by the same post with the pendulum connection of the same, and the latter a plan of the same. *A'* is the post. *B' B'* are the arms. *E' E'* are the bars, and *I'* is the pendulum, which may be caused to impose itself against the two branches *rr* of the arms, as shown in Fig. 7, or against one face of the bars *E' E'* themselves, either by the force of a spring placed between it and the post *A'* pressing against it, or by the force of gravitation, as developed by a proper arrangement of its center of gravity.

Rigid bars may be substituted for wires as conductors in all applications of my invention, and it is practicable to employ the rails of a railroad-track as the conductors of the outside line by properly insulating them from the earth, and by applying to them, in a manner substantially the same as the foregoing, circuit-closers, circuit-breakers, and circuit-receivers.

A shedding may be constructed from post to post over the entire length of the line to protect the circuit-closers and works generally from incasement or interruption by sleet or ice.

What I claim as my invention, and desire to secure by Letters Patent, is—

Constructing the stationary telegraph-line of a series of immovable and interposed movable conductors, and furnishing the vehicle with a circuit-breaker, circuit-receivers, and conductors, arranged to operate substantially as herein set forth, for the purpose of breaking the circuit through the main line at a point or points where the vehicle is passing and completing the circle through the vehicle, so that by suitable telegraphing-instruments or apparatus carried by the vehicle communications may be transmitted and received by the vehicle to and from other vehicles, or to or from stations at a distance, either while the vehicle or vehicles are stationary or in motion, as herein fully set forth.

WM. D. WESSON.

Witnesses:

W. J. SAGE,  
E. H. GROW.