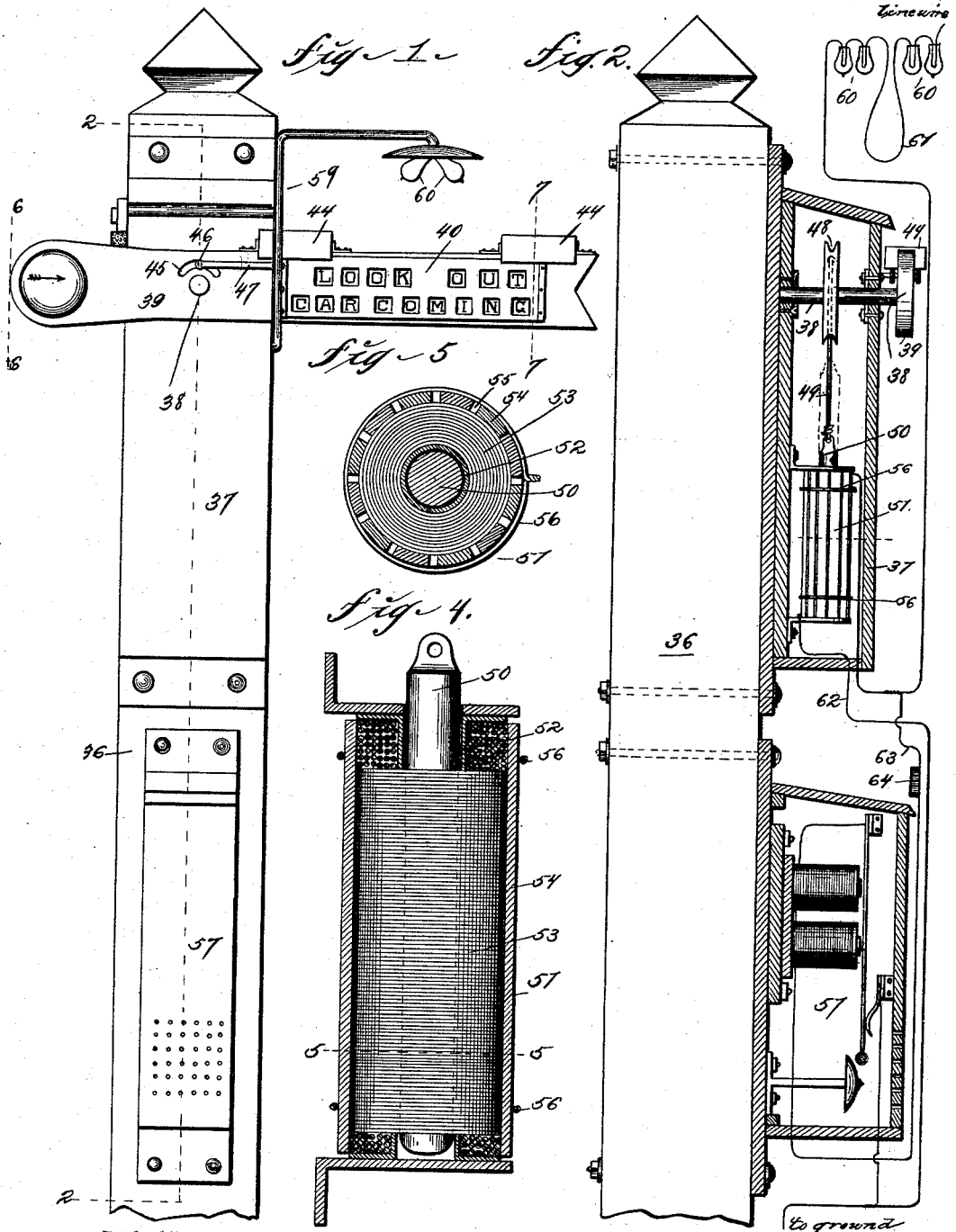
(No Model.) 3 Sheets—Sheet 1.

E. A. HERMANN.

AUTOMATIC ELECTRIC SIGNALING DEVICE.

No. 524,548. Patented Aug. 14, 1894.



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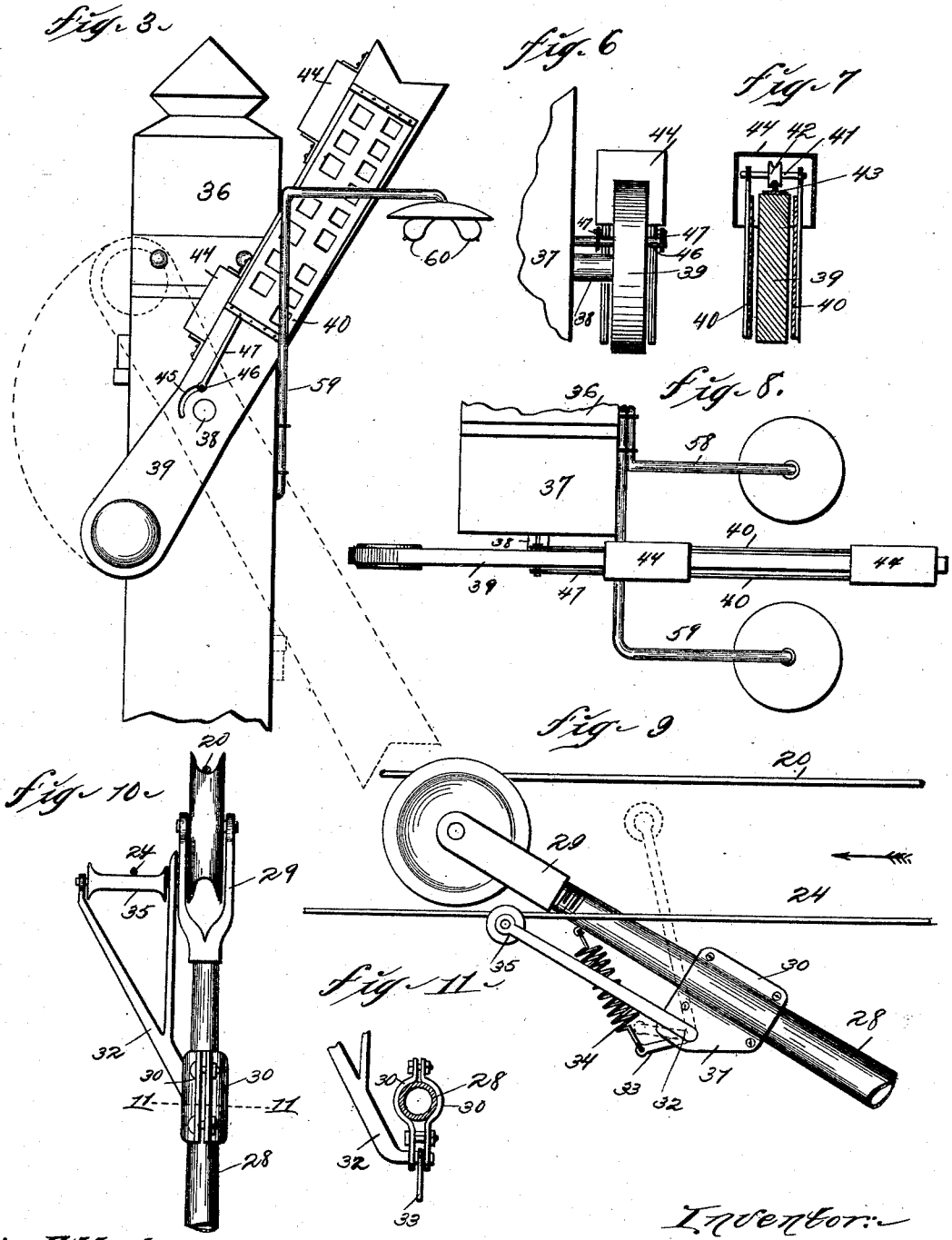

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(No Model.) 3 Sheets—Sheet 3.

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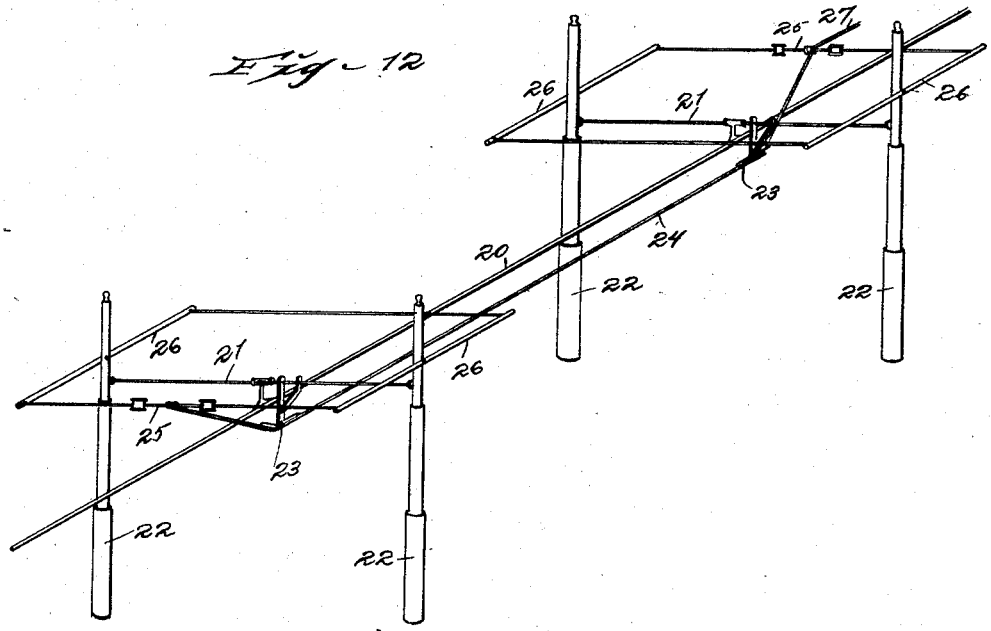
Fig. 12.



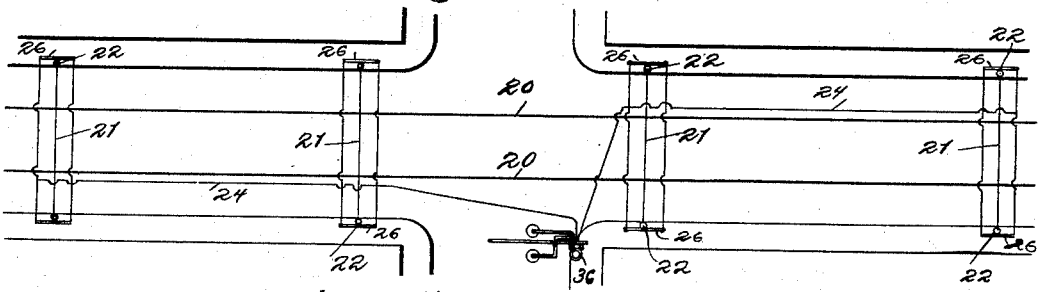
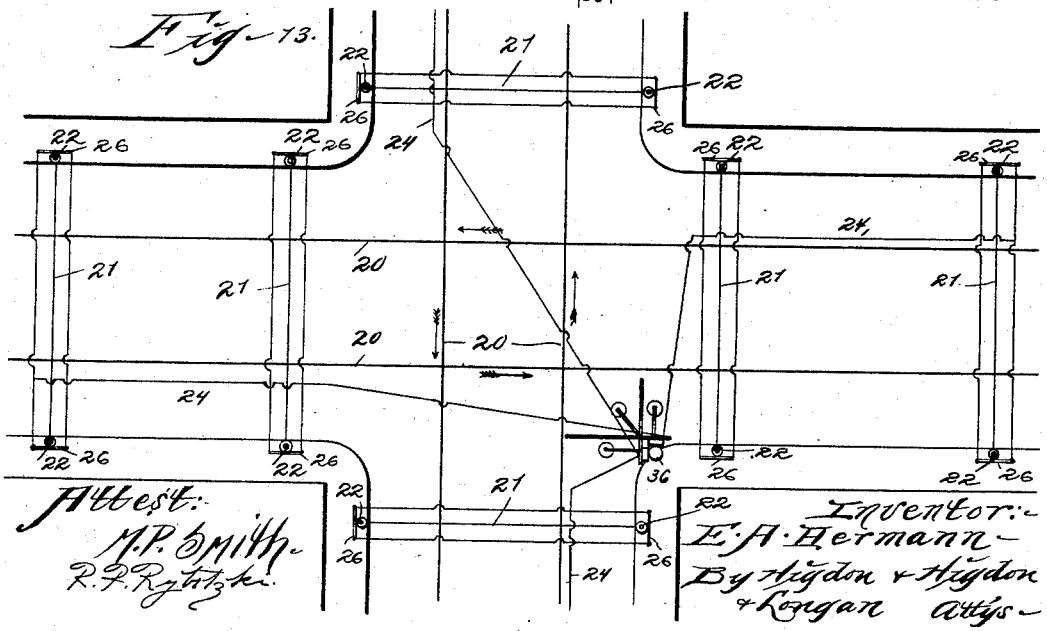


Fig. 13.



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UNITED STATES PATENT OFFICE.

EDWARD ADOLPH HERMANN, OF ST. LOUIS, MISSOURI.

AUTOMATIC ELECTRIC SIGNALING DEVICE.

SPECIFICATION forming part of Letters Patent No. 524,548, dated August 14, 1894.

Application filed April 16, 1894. Serial No. 507,651. (No model.)

To all whom it may concern:

Be it known that I, EDWARD ADOLPH HERMANN, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Automatic Electric Signaling Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to improvements on United States Letters-Patent No. 518,525, which were granted to me on the 17th day of April, 1894.

Referring to the drawings: Figure 1 is a side elevation of a post upon which is mounted my improved signal. Fig. 2 is an elevation, partly in section, on the line 2—2 of Fig. 1. Fig. 3 is a side elevation similar to Fig. 1, showing the semaphore in different positions. Fig. 4 is a sectional elevation of the solenoid. Fig. 5 is a transverse sectional view on the line 5—5 of Fig. 4. Fig. 6 is a view on the line 6—6 of Fig. 1 in the direction of the arrow. Fig. 7 is a transverse sectional view on the line 7—7 of Fig. 1. Fig. 8 is a plan view of Fig. 1, portions being broken away. Fig. 9 is a side elevation of the trolley-head in contact with the wires. Fig. 10 is a front view of Fig. 9 in the direction of the arrow. Fig. 11 is a transverse sectional view on the line 11—11 of Fig. 10. Fig. 12 is a perspective view, illustrating the construction of the conductors. Fig. 13 is a diagrammatic illustration of the complete device.

In the construction of the device and apparatus as shown, the numerals 20, 20 indicate conductor-line wires or trolley-wires of an electric railway system, which are supported by guy-wires 21, 21 connected to posts 22, 22 in an ordinary manner. Fixed to, and depending from, the guy-wires 21, 21 are hangers 23, to which hangers are rigidly connected signal-trolley-wires 24, the said signal trolley wires occupying a plane approximately parallel to, and on one side of, and below, the trolley-wires 20.

The signal trolley wires 24 are formed in disconnected sections, one end portion of each section being connected to a tie-rod 25 of a frame 26, supported on the posts 22, the remaining end of each section having a connection with the signaling apparatus hereinafter to be described, the said remaining end of the section being indicated at 27 in Fig. 12.

An electrical connection is established between the trolley wire 20 and a section of the signal trolley wire 24 in the following manner, reference being had to Fig. 9:

A trolley pole 28 is fixed to, and extends upwardly from, a car, which trolley pole, as indicated, is a conductor, and is provided with a rolling-contact head 29 adapted for engagement with the trolley wire 20. Fixed to the trolley pole 28, a distance below the head 29, are clamps 30, engaging each other, which said clamps are provided with downwardly extending flanges 31 transversely co-incidingly apertured.

Mounted in the transverse apertures, in the flanges 31, is a crank-arm 32 to be hereinafter known as the signal trolley brace. Keyed to the horizontal portion of the signal trolley brace is a downwardly extending arm 33, to the outer end of which is connected a retractile spiral spring 34, the said spring also having a connection with the pole 28, adjacent to the head 29.

Formed on the upper and outer end of the long arm of the signal trolley brace is a contact head 35, adapted for rolling contact with the signal trolley wire 24. By reference to Figs. 10 and 11, it will be observed that the signal trolley brace has its longitudinal axis in a plane obliquely to the vertical plane of the pole 28, and approximately parallel to the longitudinal plane of said pole, thus providing for the engagement of the head 25 with the signal trolley wire 24, which, as has heretofore been stated, is laterally removed from the trolley wire 20.

A signal post 36 is provided, preferably located adjacent to the track line, and within visual distance of the said track, on one side of which signal pole is mounted a preferably-metallic box 37 (Figs. 1 and 2). Transversely seated in the box 37 is a rock-shaft 38, one end portion of which rock-shaft extends outside said box, and has rigidly connected thereto a semaphore 39. One arm of the semaphore 39 is weighted, and the other arm is

provided with visual signals, or symbols, serving as signals, which symbols are arranged in alternate relation. Mounted upon the sides of the semaphore arm are slides 40, which said slides are connected by means of shafts 41, 41, having anti-friction rollers 42 mounted thereon and adapted to travel on a track 43, rigidly secured to the top of the semaphore arm.

Mounted on the semaphore arm, and inclosing the shafts 41, rollers 42 and tracks 43, are hoods 44, which said hoods protect the said devices inclosed thereby from the elements. The slides 40 are transversely apertured, the said apertures co-inciding with the alternate symbols on the semaphore arm, and adapted to permit the visibility of the said symbols.

Formed in the semaphore, approximately concentric with the rock-shaft 38, is a slot 45, and fixed to the box 37, and extending through said slot, is a pin 46, which said pin is pivotally connected to one end of an arm 47, the opposite end of which arm is pivotally connected with one of the slides 40.

Mounted upon the central portion of the rock-shaft 38 is a drum 48 (or sector of a drum), to the periphery of which is attached the upper end of a cord 49, the lower end of which cord is connected with the upper end of a solenoid bar 50 adapted for reciprocation within a solenoid 51, mounted within the box 37.

Referring to Figs. 4 and 5, it will be observed that the solenoid 51 comprises an annular core plate 52, forming a spool, upon which is spirally wound an insulated wire 53, which insulated wire is covered by narrow iron strips 54, extending longitudinally of the solenoid and separated by insulation 55, the said strips 54 being bound to the coiled wire by bands 56, 56. This construction confines and concentrates the lines of force produced by the passage of the current through the solenoid and prevents the dissipation thereof, thereby increasing both the power exerted on the bar 50, and the range of movement of said bar.

Mounted upon the post 36, beneath the box 37, is a box 57, perforated in one of its faces, within which box is mounted an electric bell.

Mounted upon the upper portion of the post 36, and extending outwardly therefrom, parallel to and above the semaphore 39, are supporting arms 58, 59, on the outer ends of which arms are mounted hooded incandescent lamps 60, preferably of colored glass.

A conductor wire 61 leads from a point of connection to the end portion 27 of the signal trolley wire 24 to and through the lamps 60, and from thence to the field coils of the solenoid 51. A conductor wire 62 leads from the field coils of the solenoid 51 to the ground circuit, or return wire of the system, and a shunt line wire 63 leads from the conductor wire 61 through the electric bell and to the conductor wire 62, a resistance coil 64 being positioned in the shunt line.

The operation of this apparatus is as follows: Upon the approach of a car to a crossing, or street intersection, the head 35 of the signal trolley brace is brought into the plane of the signal trolley wire and contacts therewith, thereby providing, through the medium of the pole 28, clamp 30, signal trolley brace 32 and head 35, an electrical connection between the trolley wires. The current is led from the end portion 27 of the signal trolley wire 24 through the lamps 60 by the conductor 61, and to the solenoid 51, from which solenoid it enters the ground, or return, circuit, by this means energizing the solenoid and exerting, by attraction, a downward pull upon the solenoid bar 50. The downward movement of the solenoid bar 50, acting through the medium of the cord 49, drum 48 and shaft 38, oscillates the semaphore, which, normally occupying the position shown in Fig. 3, is by this means brought into the position shown in Fig. 1. The oscillation of the semaphore 39 results, by reason of the sliding connection of the slides 40 with the semaphore and the rigid connection of the slides 40 with the box 37 at a point eccentric to the axis of oscillation of the semaphore, in a movement of reciprocation of the slides relative to the semaphore, whereby the apertures in said slides are caused to register with the symbols on said semaphore alternate to the symbols with which said apertures previously registered. By reason of the shunting of a portion of the current through the bell, an alarm will be sounded in said bell co-incident with the establishment of a circuit. If it be not desired to employ the sound signal, the bell may be cut off, by cutting the shunt wire.

It is obvious that upon the passage of the signal trolley brace out of contact with the signal trolley wire, the current will be disestablished, and the semaphore will reassume its normal position by reason of the gravity of the weighted end thereof.

What I claim is—

1. In a device of the class described, a supporting box, a rock-shaft mounted in said box, a semaphore mounted on said rock-shaft, slides mounted upon said semaphore, and a rod connecting said slides to the said box at a point eccentric to the axis of said rock-shaft.

2. In a device of the class described, a semaphore, slides located on opposite sides of said semaphore, shafts connecting said slides, and anti-friction rollers mounted on said shafts and adapted to ride upon the upper edge of the semaphore.

3. In a device of the class described, a semaphore pivotally mounted on a suitable support and provided with a slot concentric with its axis of oscillation, a pin mounted in said support and passing through said slot, slides mounted upon said semaphore, and a rod connecting said slides with said pin.

4. In a device of the class described, the signal trolley wire, the conductor wire leading

therefrom, the incandescent lamps in circuit with the conductor wire, the solenoid in circuit with the conductor wire, the shaft adjacent to said solenoid, the semaphore mounted upon said shaft, the drum mounted upon said shaft, the connections between the solenoid and drum, the slides mounted upon the semaphore, and means for operating the same in combination with the main trolley pole and the signal trolley brace, as set forth, for the purposes stated.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD ADOLPH HERMANN.

Witnesses:
M. G. IRION,
JNO. C. HIGDON.