No. 835,384. PATENTED NOV. 6, 1906.

J. S. ANDERSON.

ELECTRIC SIGNALING SYSTEM.

APPLICATION FILED JUNE 16, 1906.

2 SHEETS—SHEET 1.

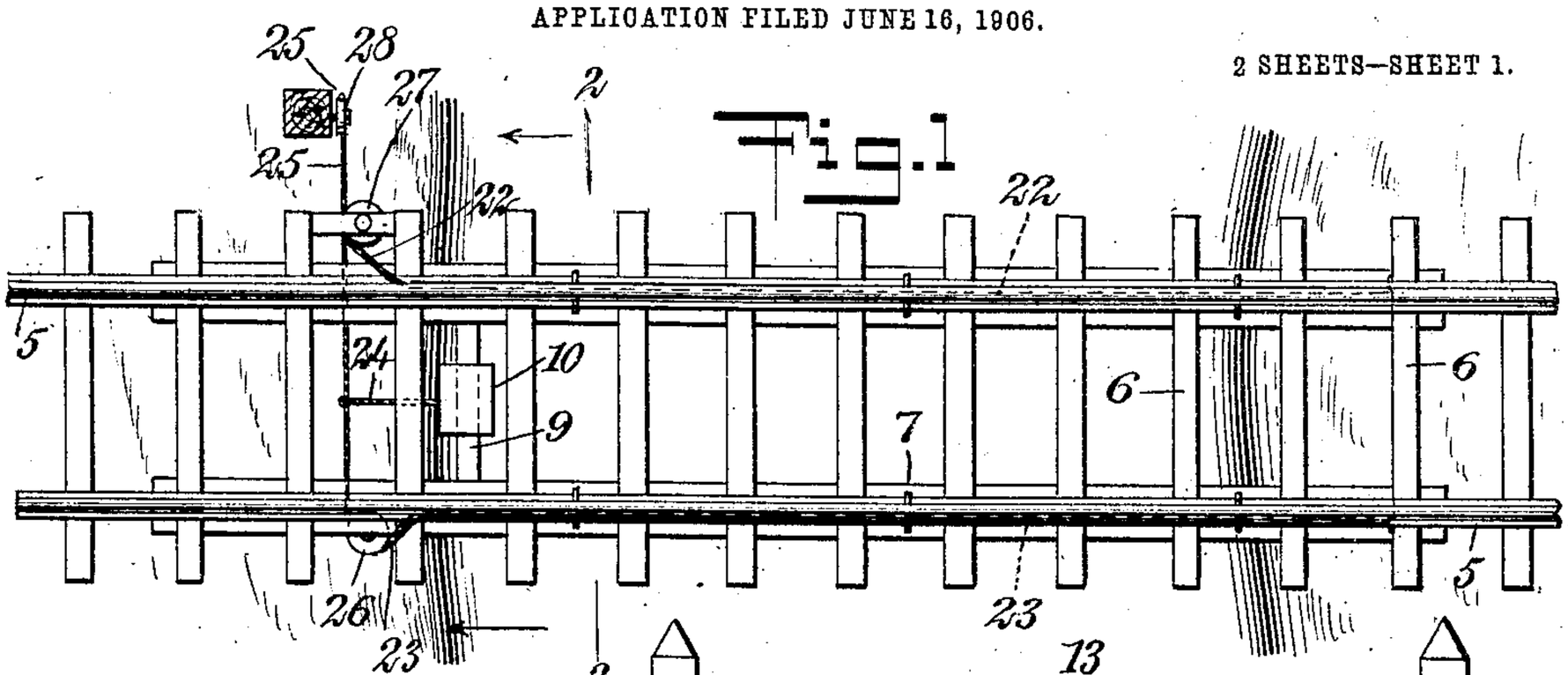

Fig. 1

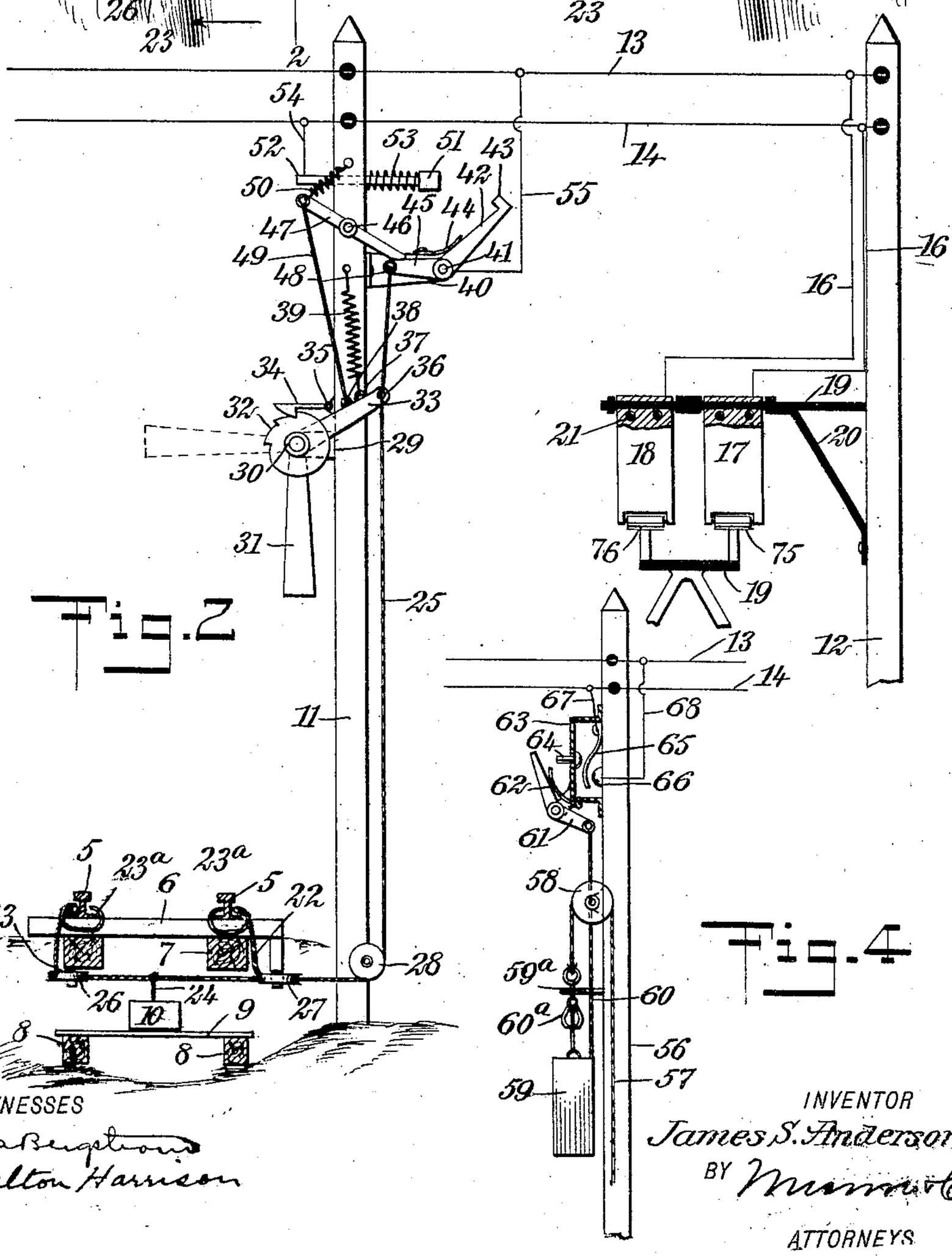

Fig. 2

Fig. 4

WITNESSES

John A. Brighton

Walton Harrison

INVENTOR

James S. Anderson

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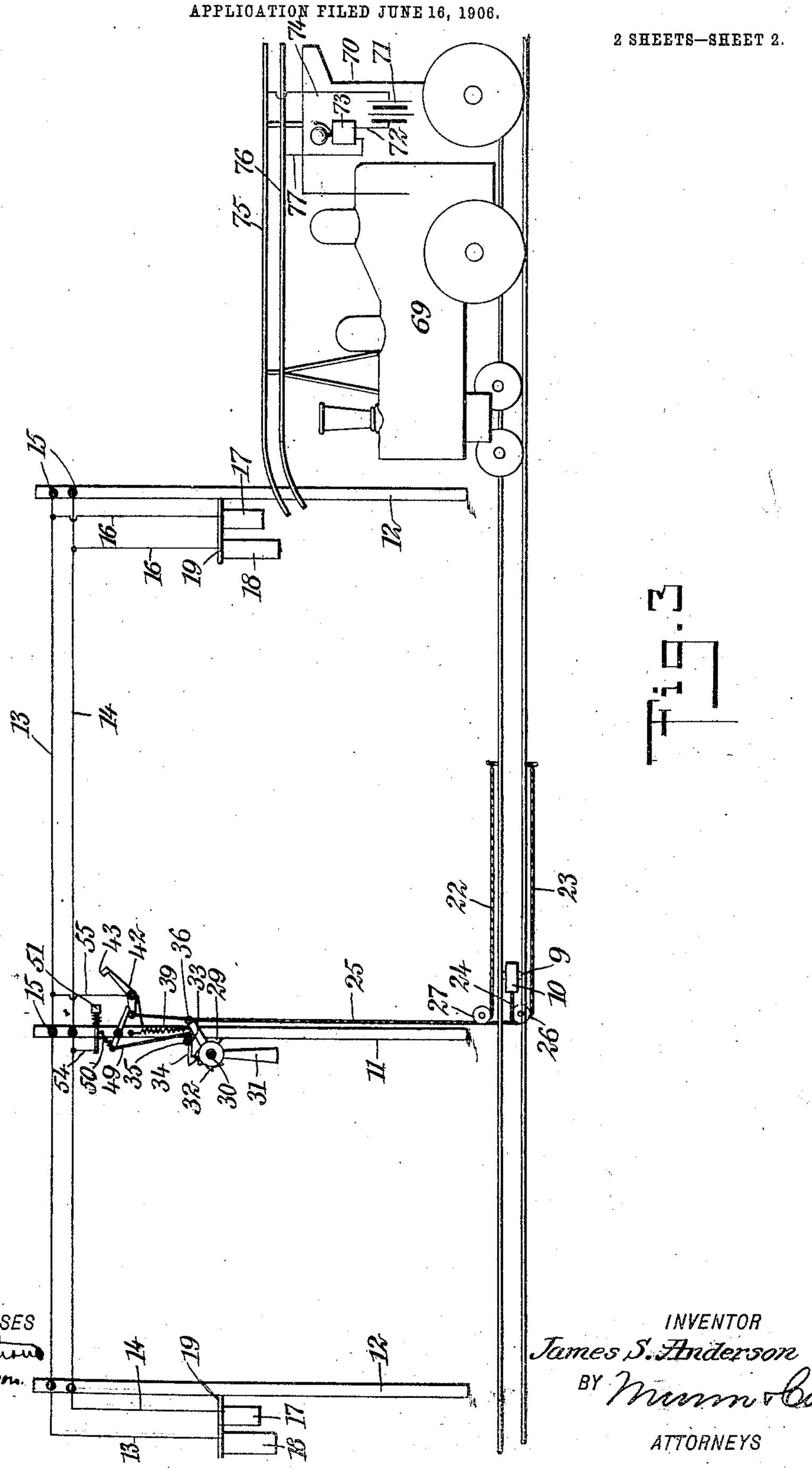

Fig. 1.

WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES S. ANDERSON, OF AMES, NEBRASKA.

ELECTRIC SIGNALING SYSTEM.

No. 835,384. Specification of Letters Patent. Patented Nov. 6, 1906.

Application filed June 16, 1906. Serial No. 321,995.

To all whom it may concern:

Be it known that I, JAMES S. ANDERSON, a citizen of the United States, and a resident of Ames, in the county of Dodge and State of Nebraska, have invented a new and Improved Electric Signaling System, of which the following is a full, clear, and exact description.

My invention relates to electric signaling systems, my more particular object being to enable the locomotive-engineer to receive warning in case of trouble with the railway-track. It may happen, for instance, that a portion of the track is displaced by a landslide, or a bridge may be turned, or one or more cross-ties may be dislodged, or the track maliciously tampered with by miscreants. In these and in all cases of a similar kind by means of my invention warning is given directly and automatically to the locomotive engineer as soon as the locomotive approaches within a suitable distance of the part of the track thus affected.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a fragmentary plan view of the track including a bridge and provided with my invention, certain parts being shown in section. Fig. 2 is a section across the track and showing in diagrammatic elevation certain posts and contact mechanism carried thereby as used in my invention. Fig. 3 is a diagrammatic side elevation showing the apparatus in its normal position and about to give warning to an approaching locomotive, and Fig. 4 is a fragmentary diagrammatic elevation showing a different form of contact mechanism mounted upon a post.

The surface rails are shown at 5, the cross-ties at 6, the sills at 7, and the framework of the bridge at 8. A scaffold 9 is mounted upon the framework 8 and normally supports a weight 10. If because of fire the scaffold 9 be burned, or because of accident or the act of God the scaffold be displaced or broken, the weight 10 is adapted to be released. Posts 11 12 are disposed along the track, and supported by these posts are signal-wires 13 14, secured upon insulators 15. Running downwardly from the wires 13 14 are vertical wires 16, arranged in pairs, as shown, and connected with contact members 17 18 in the form of spring-frames of sheet metal, secured upon arms 19, held in position by braces 20, and secured with the aid of bolts 21 in such manner as to be insulated from the arm and from each other. The central portion of the track (shown in Fig. 1) is supposed to be a bridge over a stream of water. Cables 22 23 are stretched across the bridge and connected with one of the cross-ties 6, the arrangement being such that if the bridge is washed away a strong pull will be given to one or both of the cables. The cables 22 23 are laid in the outside groove of the rail 5 and held in place by clamps 23^a. A cable 24 is connected with the cable 23 and with the weight 10, the latter and the cable 22 being joined together and connected with a cable 25. Pulleys 26, 27, and 28 are provided for guiding the various cables. Mounted upon each post 11 is a bracket 29, and journaled upon this bracket is a disk 30, connected with an arm 31, which is capable of serving both as a semaphore-arm and as a weight. The disk 30 is provided with teeth 32 and is connected rigidly with an arm 33. A latch 34 is pivoted at 35 and is adapted to engage the teeth 32, so as to hold the disk 30 in certain predetermined positions. The arm 33 is provided with eyes 36, 37, and 38, the eye 36 being connected with the cable 25. A spring 39 is connected with the eye 37 and with the post 11, this spring having a tendency to raise the arm 33. Mounted upon the post 11 is a bracket 40, and journaled at 41 is a lever 42, having a contact member 43 and held in position by a leaf-spring 44. This lever has a portion 45, provided with an eye 48, the latter being connected with the cable 25. Mounted upon a pivot 46 is a straight lever 47, and connecting one end of this lever with the eye 38 is a cord or short cable 49. A spiral spring 50 connects the same end of the lever 47 with the post 11 and normally maintains said lever in the position indicated in Fig. 2. After doing this the lever 47 presses gently upon the portion 45 of the lever 42 and serves as a limiting-stop for the latter. A contact member 51, having the form of a head, is mounted upon one end of a sliding rod 52, the latter being encircled by a spiral spring 53. A wire 54 connects the wire 14 with the rod 52. A wire 55 connects the pivot 41, and consequently the lever 42, with the wire 13.

Suppose now that the portion of the track shown in Fig. 1 be washed away, or that the scaffold 9 be destroyed by fire or broken or displaced, or that for any reason the track is in abnormal condition due to disaster, either

one or both of the cables 22, 23, or 24 will be pulled violently. This will occur, for instance, if the bridge breaks down, or even if the weight 10 be released by the yielding of the scaffold 9. The result is that a vigorous pull is made upon the cable 25. The effect of this is to lower the arm 33 and raise the arm 31, the latter serving somewhat after the manner of a semaphore-arm. The latch 34 engages the teeth 32, and thus holds the disk 30, and consequently the arm 31, in the new position thus assumed. The portion 45 of the lever 42 is lowered, and the contact member 43 is forced into engagement with the contact-head 51. The latter yields slightly, owing to the resilience of the spring 53, the rod 52 sliding a little to the left, according to the view shown in Fig. 2. This is for the purpose of enabling the contact members 43 51 to engage each other with a certain degree of resilience, thereby affording a good electrical connection. The contact thus being closed, a circuit hereinafter traced is also closed. The semaphore-arm 31 gives additional warning and may be observed by section bosses or other employees whose business it is to attend to the track. For instance, if a given semaphore-arm rises a little the section boss who attends to that part of the track will see that something is wrong with the track, and he can attend to the matter in time.

In the form shown in Fig. 4 the cable 57 takes the place of the cable 25 and is mounted upon a post 56. A pulley 58 is supported upon the post 56 and is engaged by the cable 57, which passes over it and supports a weight 59. A metallic casting 59^a, having the general form of an eye, is mounted rigidly upon the post. A pair of knives 60^a are so arranged that when drawn up into the eye they cut the rope. From the weight 59 another cable 60 extends upward and engages the lower end of a lever 61, pivotally supported and held normally in the position indicated by means of a leaf-spring 62. A casing 63 is mounted upon the post 56, and a button 64 is movably supported by the casing and is disposed within the path of the upper end of the lever 61. The button 64 is adjacent to a leaf-spring 65, the latter being adapted to engage and disengage a contact-button 66. The leaf-spring thus serves as a contact member. A wire 67 connects the spring 65 with the wire 14, the contact-button 66 being similarly connected by a wire 68 with the wire 13. The cable 57 being pulled by the displacement of the part to which it is connected, the weight 59, hitherto supported by the cable 57, is suddenly released and the tension of the cord or cable 60 is suddenly increased. This causes the lever 61 to press the button 64, thereby closing contact between the contact-spring 65 and the contact-button 66. This leaves the circuit partially closed—that is to say, the circuit from the contact-plate 18 through the wire to the contact-plate 17 is completed; but the system still awaits the arrival of a locomotive to complete the circuit from one of the contact-plates 18 to the other contact-plate 17. A locomotive 69 is shown at the right in Fig. 3 and is supposed to be approaching the apparatus above described. The cab is shown at 70, and mounted within it is a battery 71. From this battery a wire 72 leads to an electric bell 73. Another wire 74 leads from the battery to a catenary-rail 75. Another catenary-rail 76 is connected by a wire 77 with the bell 73. The locomotive continuing to advance, the catenary-rails 75 76 engage the contact-plates 17 18, and the following circuit is thus completed: battery 71, wire 72, bell 73, wire 77, catenary-rail 76, contact-plate 18, wire 16, wire 14, wire 54, contact members 51 43, lever 42, wire 55, wire 13, wire 16, contact-plate 17, catenary-rail 75, wire 74, back to battery 71. The circuit is substantially the same with the apparatus shown in Fig. 4, the only difference being that the current from the wire 14 passes through the wire 67, contact members 65 66, and wire 68 to wire 13 instead of passing through the contact members shown at the upper left-hand corner of Fig. 3. This circuit rings the bell 73 and gives warning to the engineer.

In case the form shown in Fig. 2 be employed it may happen that some person other than the engineer detects the disaster upon the track, being apprised in the first instance by the position of the arm 31. The damage having been remedied, the latch 34 is raised and the arm 31 lowered to normal position, as indicated in Fig. 2.

It will be understood that I do not limit myself to any particular means for connecting the cable with the track or with a fixture, for the reason that this step may be accomplished in a multitude of ways, all coming within the scope of my invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of an electric circuit, a part of which is mounted upon a moving train, contacts controllable by movements of said train for partially closing said circuit, a contact disposed adjacent to the track and normally open, a cable connected with said contact for closing the same, a weight connected with said cable for pulling the latter, a severable member temporarily supporting said weight, and means connected with a railroad-track and controllable by the yielding thereof for cutting said severable member.

2. The combination of a track, cables connected therewith, contact mechanism controllable by said cables, mechanism connected with said cables and provided with a sema-

phore-arm for raising the latter when said cable is actuated, pawl-and-ratchet mechanism for holding said semaphore-arm in various positions according to the degree of pull upon said cable, and an electric circuit connected with said contact and controllable by movements of rolling-stock for the purpose of closing said contact.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES S. ANDERSON.

Witnesses:
WM. E. SMAILS.
VICTOR SEITZ.