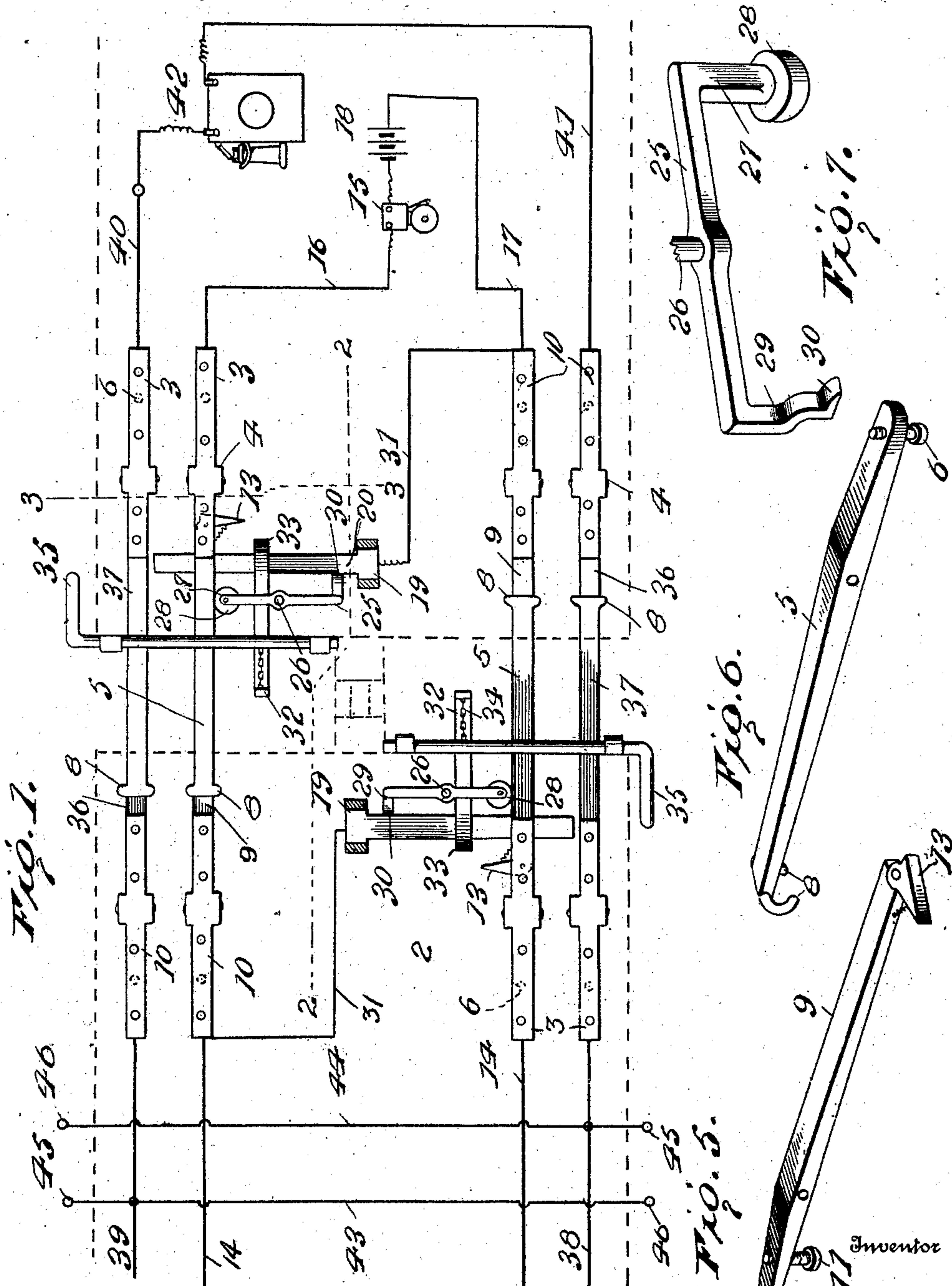


No. 850,511.

PATENTED APR. 16, 1907.

J. S. ANDERSON.
TRAIN SIGNALING SYSTEM.
APPLICATION FILED MAY 29, 1906.

2 SHEETS—SHEET 1.



Witnesses
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2 SHEETS—SHEET 2.

Fig. 3.

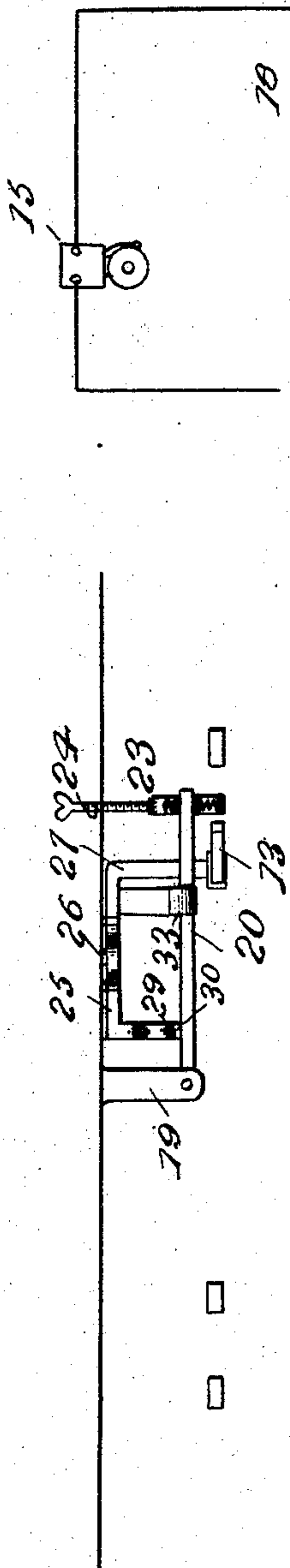


Fig. 2.

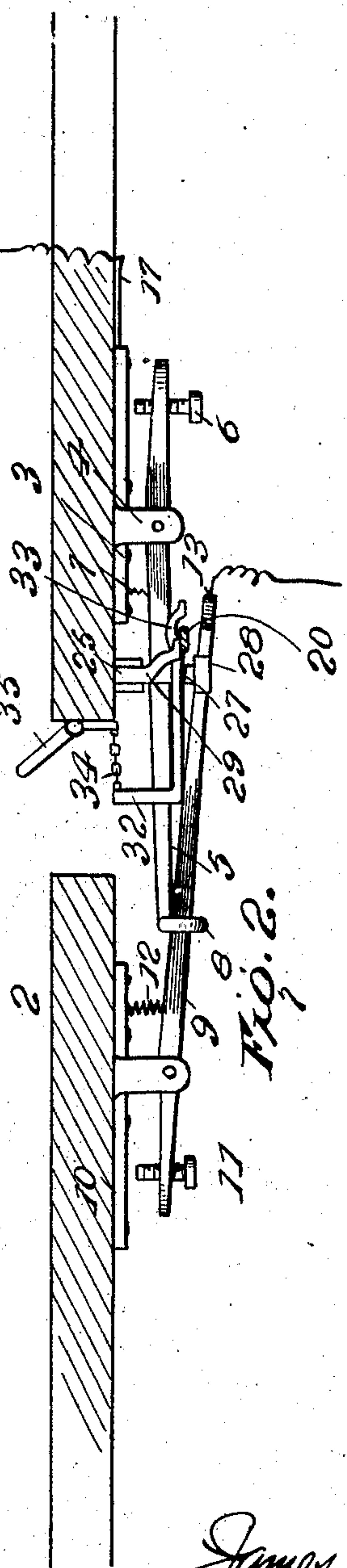
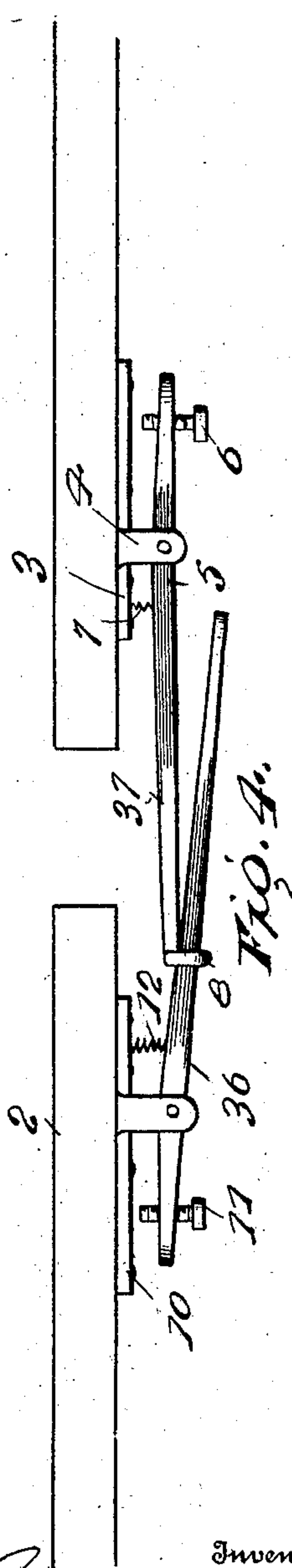


Fig. 4.



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JAMES S. ANDERSON, OF AMES, NEBRASKA.

TRAIN SIGNALING SYSTEM.

No. 850,511.

Specification of Letters Patent.

Patented April 16, 1907.

Application filed May 29, 1906. Serial No. 319,330.

To all whom it may concern:

Be it known that I, JAMES S. ANDERSON, a citizen of the United States, residing at Ames, in the county of Dodge and State of Nebraska, have invented certain new and useful Improvements in Train Signaling Systems, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention relates to an improvement in signaling systems, designed primarily for use as a train system, wherein each of the cars of the train are arranged in and form a part of the system.

15 The main object of the present invention is the provision of means whereby the accidental breaking of a train or the separation of any one or more cars therefrom will be instantly known to the engineer by the automatic sounding of an alarm, said means being specifically arranged and constructed to permit uncoupling of the cars when desired without energizing the alarm.

20 Another object of the invention is the provision of means whereby the coupling of the cars will automatically complete a telephone-circuit providing for direct communication between the engineer and train crew, the system being arranged to complete the circuit through a telephone in any car of the train.

25 The preferred details of construction of the present invention will be described in the following specification, reference being had particularly to the accompanying drawings, in which—

30 Figure 1 is a top plan illustrating the details of my improved system as applied to a locomotive and adjacent car, the locomotive and car being shown in dotted outline. Fig. 2 is a longitudinal section on line 2 2 of Fig. 1. Fig. 3 is a transverse section on line 3 3 of Fig. 1. Fig. 4 is a partial side elevation showing the automatic circuit-closer for the telephone-circuit. Fig. 5 is a perspective of the contact-arm of the signal-circuit. Fig. 6 is a perspective of the contact-plate of the signal-circuit. Fig. 7 is a perspective of the hook-lever for normally preventing closing of the signal-circuit.

35 Referring particularly to the drawings, wherein like reference-numerals indicate like parts throughout the several views, my improved signal-circuit extends throughout the length of the train, each car being provided with a normally open shunt-circuit,

including as much of the signal-circuit as is carried on that particular car. By this construction, with the parts arranged as herein-after described, the accidental separation of any two cars will automatically bridge the break in the shunt-circuit, and thereby complete the signal-circuit and sound the alarm.

40 In the details of the present invention it is to be understood that each car is identically equipped. Therefore a detailed description of the equipment for the meeting ends of two of the train-vehicles, as a locomotive 1 and a car 2, will suffice for all.

45 With particular regard to the signal system, therefore, the locomotive 1 is provided on the under side with a plate 3, fixedly secured to the floor of the locomotive and formed with depending ears 4. A movable contact, hereinafter termed the "contact-plate" 5, is pivotally supported in the ears 4, the shorter end of said plate being in advance of the pivotal support and provided with an adjusting-screw 6, designed to bear against the plate 3 and limit the play of the plate 5, a spring 7 being arranged in rear of the ears 4 and bearing between the plates 3 and 5 to insure operative position of the contact-plate, as will later appear. The rear end of the plate 5 is formed with depending curved fingers 8, spaced apart to provide, in effect, an open ring for the reception of the contact-arm.

50 9 represents a contact-arm pivotally supported from a plate 10, secured to the under side of the car-body 2, said arm being provided with an adjusting-screw 11 and operating-spring 12, as in the details of the contact-plate. The forward end of the arm 9 is preferably reduced in size to provide for its ready entrance between the fingers 8 of the contact-plate. The free end of the arm 9 is further provided with a dog 13, pivotally supported thereon and so mounted as to be limited in movement in a rearward direction to dispose said dog at right angles to the arm, the forward limit of movement of the dog disposing the latter in alinement with the arm.

55 One plate 5 and arm 9 constitute the movable contacts of the signal-circuit between the adjacent cars, it being understood that two pairs of said contacts are carried by the adjacent ends of the cars, one member of each of said pairs being disposed adjacent the respective side edges of the car. The plates 3 and 10 form part of the circuit, being on

each respective car electrically connected with each other, as by wires 14. By preference the pair of contacts carried by the end of each car include both a contact-arm and a contact-plate, the cooperating elements on the proximate end of the next car being respectively the reverse, so that the meeting ends of the cars are each provided with a contact-arm and a contact-slide. As the cars approach the coupling situation the reduced end of the contact-arm of one pair of contacts will be guided between the fingers 8 of the respectively cooperating contact-plate, thus electrically connecting the cars. An alarm 15, here shown as an electric bell, is carried on the locomotive or other convenient place and is in circuit with the plates 3 10 of the locomotive by conductors 16 17, said circuit also including a battery or other source of energy 18. These connections provide a normally open circuit the two branches of which extend throughout the length of the train, one branch including the conductor 17 and parts 10, 9, 5, 3, and 14 upon one side of the train and the other branch including the bell 15, the conductor 16, and parts 3, 5, 9, 10, and 14 on the opposite side of the train, as will be readily understood upon reference to Fig. 1.

One object of the present invention is to provide means whereby this open signal-circuit will be automatically closed upon the accidental separation of any two cars of the train. To this end I pivotally support in a hanger 19 a transversely-arranged contact-bar 20, adjusted as to the normal position through the medium of a spring connection 23, which is adjustably tensioned through a set-screw 24, fixed in any convenient part of the structure. The outer or free end of the contact-bar extends transverse the operative path of one of the contact members, as the plate 5, being disposed below the same and normally out of engagement therewith. As the plate 5 is slightly elevated at the rear end against the tension of spring 7 during the coupling operation of the contact members, said plate when coupled will be farther removed from engagement with the contact-bar. The normal position of this bar, however, is such that when said plate 5 is in normal position—that is, at the full limit of its downward movement—it will engage the contact-bar. As this engagement, as will later appear, bridges the signal-circuit to complete the same, it is obvious that means must be provided for holding the contact-bar out of reach of the contact-plate under normal circumstances. For this purpose I arrange adjacent the contact-bar what I term a “hook-lever” 25, pivotally supported upon a rod 26, depending from the car and spring-pressed to maintain a normal position in alinement with the contact-bar. One end of the lever depends in the form of a stud 27,

upon the lower end of which is secured a head 28, the parts being normally so disposed that the head 28 is in the path of the dog 13 of the contact-arm during the coupling operation of the contact members. The opposite or inner end of the lever 25 is provided with a depending arm 29, terminally provided with a rearwardly-projecting lip 30, the upper face of which is beveled, while the lower face is squared for engagement with the upper surface of the contact-bar. The lip 30 is so disposed relative to the contact-bar that the normally free position of said bar is on a plane in vertical alinement with and above the lip, as clearly shown in Fig. 1.

The normal situation of the parts provides that the lip 30 bears upon the upper surface of the contact-bar with the effect to depress the free end of said bar to a position beyond possible contact with the contact-plate 5, thus preventing the closing of the circuit, as hereinafter explained. The plate 10, carrying the contact member opposite the contact member of the pair on any one car with which the contact-bar cooperates, is in electrical connection with said bar through a conductor 31.

In the coupling operation of the cars, assuming the contact-bar in normal position—that is, depressed by the hook-lever beyond possible contact with the contact-plate 5, the dog 13 of the cooperating contact-arm engages the plate 28 of the hook-lever, swinging the lip 30 from above the contact-bar and permitting the latter to assume the operative position, the slight upward movement of the contact-plate incident to the coupling operation, raising said plate above its normal position and therefore out of possible contact with the contact-bar. Should the cars be accidentally separated, however, the contact-plate will drop to normal position, engaging the contact-bar and completing a circuit, which may be traced as follows: from the battery 18 through the conductor 17, the plate 10, the conductor 31 on the locomotive, the contact-bar 20, the plate 3, the conductor 16, the bell 15, and from the latter to the battery, as will be seen upon reference to Fig. 1. The alarm will thus be sounded and the engineer at once notified of a break in the train.

As it is necessary at times to designedly separate the cars, provision must be made for so operating the parts as to prevent the sounding of the alarm under these conditions. To accomplish this result, I arrange a slide-bar 32 longitudinally of the car and overlying the contact-bar. In the normal position of the slide-bar the latter is out of engagement with the contact-bar through the medium of an offset 33, formed in said bar, said offset being of sufficient height relative to the normal plane of the bar as to provide for all necessary movements of the contact-bar.

The plane of the main portion of the slide-bar is such that it will depress the contact-bar as the slide-bar is moved forwardly over said contact-bar. The extent of movement of the contact-bar under the operative influence of the slide-bar is such that said contact-bar will be thereby depressed into a plane below the lip 30 of the hook-lever, the downward movement of the contact-bar engaging the upper beveled portion of the lip and moving said lip out of the path, said hook-lever, however, returning to normal position and disposing the lip 30 above the contact-bar and holding the latter depressed. The slide-bar 32 is directly connected, preferably through a chain or other flexible connection 34, with the ordinary uncoupling-lever 35 of the car, so that upon manual operation of said lever 35 to uncouple the cars the contact-lever will be moved to and locked in normal position, so that the alarm-circuit will remain open.

It is to be understood that each car of the train is provided at each end with a pair of contact members, the contact-plates of each pair being diagonally disposed relative to the particular car, and that the means just described for automatically closing the signal-circuit and for automatically locking out the contact-bar in the manual uncoupling of the cars is arranged at each end of the car in cooperation with the contact-plate 5 of each respective pair of contact members. The system is thus complete throughout the train and provides for automatically closing the signal-circuit upon the accidental uncoupling of any car of the train.

The telephone-circuit includes contact members 36 37 identical with the contact members of the signal-circuit, said members being disposed in pairs on each car for inter-coupling as described for the signal members. The plates of the contact members of the aligned pairs of each car are connected by conductors 38 and 39, respectively, the plates of the locomotive and end car of the train being connected to the conductors 40 41 of a circuit including a telephone 42. The telephone-circuit is thus complete throughout the train and the trainmen in the rear car may readily communicate with the engineer while the train is in motion.

As an addition to the telephone-circuit I prefer to provide each car with transverse conductors 43 44, terminating in sockets 45 and 46, respectively, within or in the sides of the car. The transverse conductors are respectively connected to the telephone-circuit conductors 38 and 39 of the telephone-circuit, as shown in Fig. 1. The plugs of a portable telephone may be readily inserted in either pair of sockets of the transverse conductors, placing said portable telephone in circuit with either the locomotive-telephone or car-telephone with obvious advantages.

As described, the device provides a signal-circuit designed to automatically notify the engineer upon the accidental separation of any car or cars from the train, means being provided for rendering the signal-circuit inoperative in the manual uncoupling of the cars. A telephone-circuit is also provided whereby communication may be readily had with the engineer or train crew from any part of the train.

Having thus described my invention, what I claim as new is—

1. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, a circuit-closer carried by each car and arranged for operation on the separation of any car from coupled position, and means operated in the manual uncoupling of the cars to render the circuit-closer inoperative.

2. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, a circuit-closer carried by each car and automatically operable on the separation of any car from coupled position, and means automatically operated in the manual uncoupling of the cars to prevent operation of the circuit-closer.

3. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each car and arranged for coupling in the coupling of the cars, a contact-bar in circuit with one of said contact members and supported adjacent the path of the other of said members, and means for normally locking said contact-bar beyond the influence of the adjacent contact member.

4. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each car and arranged for coupling in the coupling of the cars, a contact-bar in circuit with one of said contact members and supported adjacent the path of the other of said members, means for normally locking said contact-bar beyond the influence of the adjacent contact member, and means for releasing the contact-bar from the locking means in the coupling operation of the cars.

5. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each car and arranged for coupling in the coupling of the cars, a contact-bar in circuit with one of said contact members and supported adjacent the path of the other of said members, means for normally locking said contact-bar beyond the

influence of the adjacent contact member, and means carried by the contact member of one car for releasing the contact-bar of the adjacent car from said locking means in the coupling operation of the cars.

6. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each car and arranged for coupling in the coupling of the cars, a contact-bar in circuit with one of said contact members and supported adjacent the path of the other of said members, and a hook-lever for normally depressing the contact-bar beyond the influence of the adjacent contact member.

7. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each car and arranged for coupling in the coupling of the cars, a contact-bar in circuit with one of said contact members and supported adjacent the path of the other of said members, a hook-lever for normally depressing the contact-bar beyond the influence of the adjacent contact member, and means carried by the contact member of one car for operating the hook-lever of the adjacent car to release the contact-bar.

8. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each car and arranged for coupling in the coupling of the cars, a contact-bar in circuit with one of said contact members and supported adjacent the path of the other of said members, a hook-lever for normally depressing the contact-bar beyond the influence of the adjacent contact member, means carried by the contact member of one car for operating the hook-lever of the adjacent car to release the contact-bar, and means for depressing the contact-bar within the influence of the hook-lever in the manual uncoupling of the cars.

9. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each of said cars and arranged for coupling in the coupling of the cars, a contact element in circuit with one of said contact members and supported adjacent to the path of the other of said members, a lever for holding the contact element normally beyond the influence of the adjacent contact member, means carried by the contact member of one car for operating the lever of the adjacent car to release the contact element, and manually-operative means

for moving the contact element within the influence of the lever.

10. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each car and arranged for coupling in the coupling of the cars, a contact-bar in circuit with one of said contact members and supported adjacent the path of the other of said members, a hook-lever for normally depressing the contact-bar beyond the influence of the adjacent contact member, means carried by the contact member of one car for operating the hook-lever of the adjacent car to release the contact-bar, and a slide-bar automatically operated in the manual-uncoupling of the cars to depress the contact-bar within the influence of the hook-lever.

11. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each of said cars and arranged for coupling in the coupling of the cars, a yieldably-supported swinging contact-bar in circuit with one of said contact members and disposed adjacent to the path of other of said members, a hook-lever for normally depressing the contact-bar beyond the influence of the adjacent contact member, a detent carried by the contact member of one car for operating the hook-lever of the adjacent car to release the contact-bar, and a slide-bar for depressing the contact-bar within the influence of the hook-lever.

12. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each of said cars and arranged for coupling in the coupling of the cars, a yieldably-supported swinging contact-bar in circuit with one of said contact members and supported adjacent to the path of the other of said members, a lever for normally depressing the contact-bar beyond the influence of the adjacent contact member, said lever having a beveled hook at one end and a head at its opposite end, a pivoted detent upon the contact member of one car for engaging the head upon the hook-lever of the adjacent car and releasing the contact-bar, and a slide-bar for depressing the contact-bar beneath the beveled hook of said lever.

13. The combination with a plurality of coupled cars, of a normally open circuit extending throughout the length of the connected cars, said circuit including contact members carried by each of said cars and arranged for coupling in the coupling of the cars, a yieldably-supported swinging contact-bar in circuit with one of said contact

members and supported adjacent to the path of the other of said members, a lever for normally depressing the contact-bar beyond the influence of the adjacent contact member, 5 said lever having a beveled hook at one end and a head at its opposite end, a pivoted dent upon the contact member of one car for engaging the head upon the hook-lever of the adjacent car and releasing the contact-bar, a 10 slide-bar for depressing the contact-bar beneath the beveled hook of said lever, and means for manually operating said slide-bar.

14. In an electrical coupling device, the combination with two coupled cars, of pivot- 15 plates carried by said cars, a contact-plate pivoted in said pivot-plate on one car and formed at its outer end with a loop portion, a contact-arm pivoted upon the pivot-plate on the other of said cars and adapted to enter 20 the loop portion of said contact-plate, springs

for actuating said contact-plate and contact-arm, and means for limiting the swinging movements of said contact-plate and contact-arm.

15. In an electrical coupling device, the 25 combination with two coupled cars, of pivot-plates thereon, coacting members pivoted intermediate their ends in said pivot-plates, one of said members having a loop portion at its outer end to receive the outer end of the 30 other of said members, and set-screws in the short inner ends of said members for engagement with said pivot-plates to limit the swinging movement of said members.

In testimony whereof I hereunto affix my 35 signature in presence of two witnesses.

JAMES S. ANDERSON.

Witnesses:

WM. E. SMAILS,
VICTOR LUTZ.