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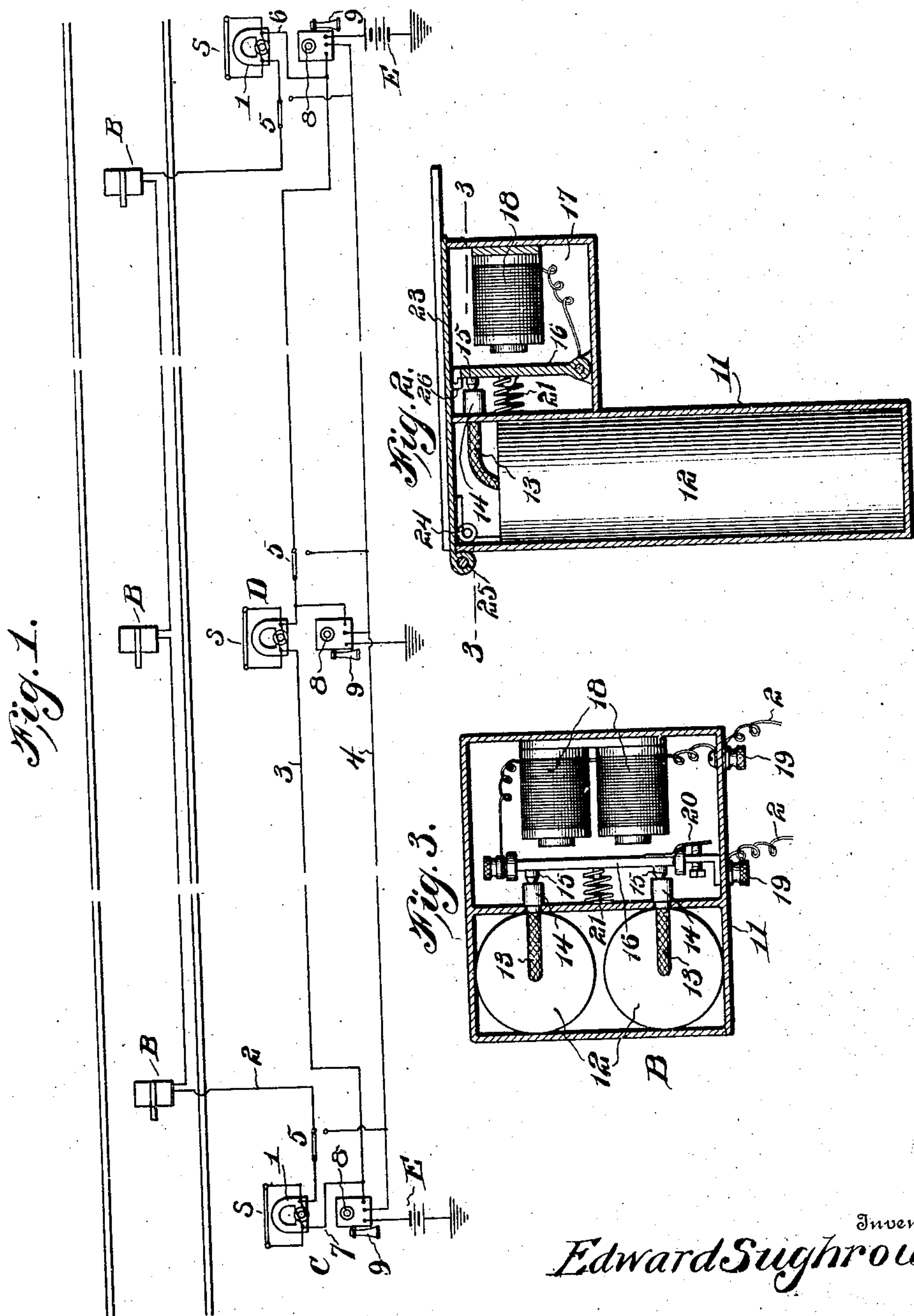
PATENTED APR. 28, 1908.

E. SUGHROVE.

RAILROAD DANGER SIGNALING AND TELEPHONING APPARATUS.

APPLICATION FILED MAY 18, 1907.

2 SHEETS—SHEET 1.



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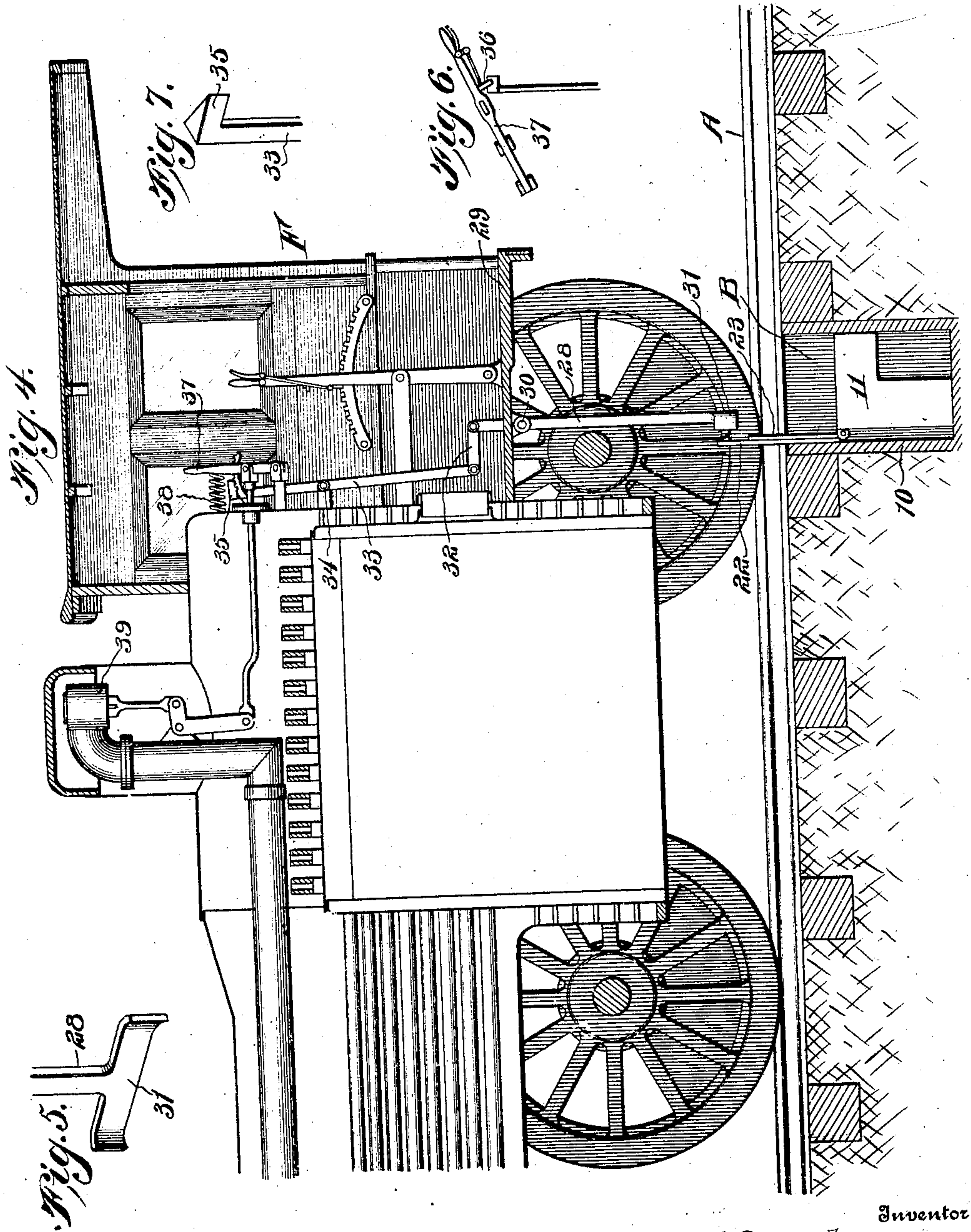
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

EDWARD SUGHROUE, OF BARTLEY, NEBRASKA.

RAILROAD DANGER-SIGNALING AND TELEPHONING APPARATUS.

No. 886,269.

Specification of Letters Patent.

Patented April 28, 1908.

Application filed May 18, 1907. Serial No. 374,329.

To all whom it may concern:

Be it known that I, EDWARD SUGHROUE, a citizen of the United States, residing at Bartley, in the county of Redwillow and State of Nebraska, have invented new and useful Improvements in Railroad Danger-Signaling and Telephoning Apparatus, of which the following is a specification.

This invention relates to a railroad danger signal of that type whereby a red light, rocket or the like can be set off to notify the engineer of an approaching train of danger ahead, so that he can stop the train before an accident occurs.

The invention has for one of its objects to improve and simplify the organization and arrangement of apparatus of this character so as to be comparatively easy and inexpensive to manufacture and install, thoroughly reliable and efficient in use, and composed of few parts.

A further object of the invention is the provision of a pyrotechnic signal associated with a telephone system connected with the stations along the road, whereby current from the generators or the like can be employed for firing off the signal or signals.

A still further object is the employment of an emergency device for stopping a locomotive in case the engineer should run past a signal without heeding the same, the said emergency device being thrown into operative position by the means for setting off the signal.

Another object is the provision of a combined signaling and engine stopping device which can be readily controlled by the operator at either of two adjacent stations or at a point intermediate the station by a person having the necessary apparatus, such for instance as a portable magneto telephone set that can be connected in circuit with the telephones at the stations and with the circuit including the signaling devices, whereby the station operators can be informed or the signaling circuit energized for setting off the signals.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one of the embodiments of the in-

vention, Figure 1 is a diagrammatic view of the telephone and signaling circuits. Fig. 2 is a vertical section of one of the combined signaling devices and trips for the engine stop. Fig. 3 is a horizontal section on line 3-3, Fig. 2. Fig. 4 is a vertical longitudinal section of the cab end of the locomotive, showing the automatic stopping device. Fig. 5 is a detail perspective view of the lower end of the trip-actuated lever for the locomotive. Fig. 6 is a front view of the throttle lever and latch-releasing device, Fig. 7 is a detail perspective view of the throttle latch releasing device.

Similar reference characters are employed to designate corresponding parts throughout the several views.

Referring to the drawings, and more particularly to Fig. 1, A designates the rails of a railroad track between which and at suitably remote points are located signaling devices designated by B which are adapted to be set off by suitable apparatus at the nearest station or by apparatus of portable form which can be connected in circuit at any point intermediate the station, as for instance by a brakeman or other train hand, it being advantageous for all trains to be equipped with one or more portable apparatus for connecting in circuit at any desired point as occasion requires. In the present instance, the signaling devices are associated with a telephone system extending from station to station. The telephone sets designated generally by C each includes a magneto 1 for the ringing current of the telephone. The magnetos are connected with the signaling devices B by the conductor 2 in which the devices are arranged in series relation, so that all of them will be set off at once to insure at least one signal being displayed in front of the engine. Between the two telephone sets C are line wires 3 and 4 to which may be connected a portable telephone set designated by D. At each telephone set is a switch 5 whereby the magnetos may be connected with the telephone circuit for sending a ringing current or whereby they may be connected with the conductor 2 for sending current to actuate the signaling devices B, one of the line wires of the telephone circuit being employed to form the other side of the signaling circuit. With the station sets C are connected batteries E for supplying the current. Normally the switches 5 will be in the

position shown so that upon operating any of the magnets, current will be supplied for firing off the pyrotechnic signaling devices. Assuming that the magneto 1 at the left hand telephone set is actuated, current will be supplied to the circuit including the switch 5, conductor 2, devices B, switch 5 at the right-hand telephone set, shunt S around the magneto of the said set, conductor 6, line wire 3 of the telephone circuit, conductor 7, and back to the armature of the magneto 1 of the left-hand telephone set. By the same circuit, the signaling devices can be set off by current produced by the magneto of the right-hand telephone set. In case the portable set D is connected in circuit for actuating the signaling devices, the current would traverse one part of the line wire 3, shunt S of one of the station telephone sets, conductor 2, devices B, shunt S of the other telephone station set, and back to the magneto of set D through the other portion of the line wire 3. By throwing the switches 5 so as to connect with the wire 4 a person can ring up the persons at the other telephone sets and hold conversation over the line wires 3 and 4 by means of the transmitters and receivers 8 and 9, respectively. In a combined system of the character described, messages can be transmitted from one station to the other or by a brakeman or other train hand to either or both stations from an intermediate point in the case of trouble so that the station operators can inform the proper railroad officials and take orders therefrom in view of the trouble that has arisen. Furthermore, it enables visual signaling devices to be readily controlled so as to avoid accident to trains running over the road.

Referring now to the details of construction of the signaling devices B, it will be observed that between the rails of the track are arranged casings or boxes 10 buried in the roadbed, as further shown in Fig. 4 and containing the operating parts of the devices B. In each box 1 is a removable casing 11, as shown in Figs. 2 to 4 inclusive, that contains one or more rockets 12 or other suitable pyrotechnic contrivance. Each rocket has a fuse 13 provided with a cap or cartridge 14 which is fired by a firing pin 15. Preferably the firing pins are arranged on an armature 16 provided in an offset compartment 17 of the casing 11 and arranged to be actuated to firing position by electro-magnets 18 connected in circuit with the magnetos by the conductor 2. As shown in Fig. 3, the conductor 2 is cut at each device B and the ends secured to binding posts 19, one of the latter being connected directly with the electro-magnets 18, and the other with a switch 20 that opens and closes the circuit by the movement of the armature 16. Attached to the armature is a helical contractile spring 21

which moves the armature on the firing stroke. Normally the parts are in the position shown in Figs. 2 and 3, and as soon as current is produced by any magneto, the armature will be drawn toward the cores of the magneto and immediately open the circuit by the switch 20 and permit the armature to fly back under the tension of the spring 21 and thereby cause the fuses to light. If the caps 14 should not be fired on the first impulse, the continued operation of the armature 16 under the flow of current from the magneto would positively insure the setting off of the signals.

As a further safeguard, an emergency mechanism is employed for bringing the train to rest in case the engineer should for any reason fail to see the signal and attempt to pass by the same. For this purpose, each device B is provided with a trip 22 mounted on the cover 23 of the casing 11. Normally the trip is held in lowered position and is adapted to be thrown to raised position when the rockets are set off. For this purpose, the cover 23 is provided with a torsional spring 24, Fig. 2, that tends to throw the cover upwardly on its hinge 25, and when the cover is in normal position, it is locked by means of the armature 16 which is in the form of a latch for engaging a catch 27 on the under side of the cover. By this arrangement, the energizing of the electro magnets 18 causes the armature to be released from the catch 27 so that the cover 23 and trip 22 will spring to the upright position shown in Fig. 4. The trip 22, when in upright position, is in the path of the mechanism of the locomotive for automatically closing the throttle. On the locomotive designated generally by F, Fig. 4, is a lever 28 extending through the floor of the cab and fulcrumed at 30, there being formed at the lower end of the lever a shoe 31 for engaging the trip 22. The upper end of the lever is connected by a link 32 with a second lever 33 fulcrumed on the front of the boiler at 34 and provided with a wedge-shaped upper extremity or cam 35 for engaging the latch 36 on the throttle lever 37 of the locomotive. This lever is provided with a spring 38 that tends to operate through the lever to set the throttle valve 39 but is prevented by means of the latch 36, Fig. 6, engaging the toothed section 40, Fig. 4. When the shoe 31 strikes the trip 22, the upper end of the lever 33 is moved rearwardly so as to cause the wedge 35 to automatically disengage the latch 36 for permitting the throttle to close under the effect of the spring 38, thereby bringing the locomotive to a standstill.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the inven-

tion appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative and that such changes may be made when desired, as are within the scope of the claims.

Having thus described the invention, what I claim is:—

1. In a signaling system, the combination of a plurality of pyrotechnic signaling devices, mechanical means for igniting each device, and electrical means for simultaneously actuating the mechanical means of the several devices.
2. In an apparatus of the class described, the combination of a pyrotechnic signaling device, means for firing the same, an engine stop, and a manually-controlled electric circuit for simultaneously actuating the said means and stop from a distant point.
3. In an apparatus of the class described, the combination of a pyrotechnic signaling device, means for firing the device, an engine stop, a system for transmitting messages and including a generator, and means for actuating the firing means and said stop by current derived from the generator.
4. In an apparatus of the class described, the combination of a plurality of signaling devices, a telephone system including generators, and means for connecting the generators in circuit for setting off the signaling devices or producing ringing current in the telephone system.
5. In a signaling system, the combination of a visual signaling device including a firing means, a mechanical means for setting off the firing means and for releasing the second device to move to operative position, and apparatus for controlling the said mechanical means from any desired point.
6. In a system of the class described, the combination of a visual signaling device including a firing cap, a firing device for the cap, a means for actuating the device, and a train stopping apparatus controlled by the said firing device.
7. In an apparatus of the class described, the combination of a visual signal device, an engine stop, an electro magnet having an armature for setting off the device and releasing the stop, means for holding the stop in normal position, and an electric circuit including the electro magnet.
8. In an apparatus of the class described,

the combination of a telephone system including magnetos, a plurality of signaling devices, and means for connecting the devices in circuit for actuating them at one time by any of the magnetos.

9. In an apparatus of the class described, the combination of a telephoning system including permanently connected telephone sets, and a portable telephone set, with visual signaling devices, and electrical means for actuating the said devices from any of said telephone sets.

10. In an apparatus of the class described, the combination of a telephoning system including permanently connected telephone sets, and a portable set adapted to be connected in circuit, with a combined train stopping and visual signaling device, and electrical means controlling said device from any telephone set.

11. In an apparatus of the class described, the combination of a railway track, with a combined signaling and train stopping device, said device comprising a visual signal, means for firing the signal, a member adapted to be erected adjacent the track preparatory to the firing of the signal and for stopping a train, and a controlling means for the device.

12. The combination of a visual signal, a device for firing the same, and a train stopping device held in inoperative position by the firing device and released by the latter before the signal is fired.

13. The combination of a signal including a cap, an armature, a firing pin on the armature for striking the cap, a spring for moving the armature in one direction, an electro-magnet for moving the armature in the opposite direction, and a train stopping device normally held in inoperative position by the armature and released from the latter by the electro-magnet.

14. The combination of a casing, a cover therefor forming a train stopping device, means for throwing the cover to operative position, a visual signal contained in the casing, means for firing the signal and for holding the cover normally in inoperative position, and a controlling device for the said means.

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

EDWARD SUGIROUE.

Witnesses:

N. J. UERLING,
W. A. DAVIS.