May 28, 1929. J. B. ARCHIBALD 1,715,265

SIGNALING DEVICE

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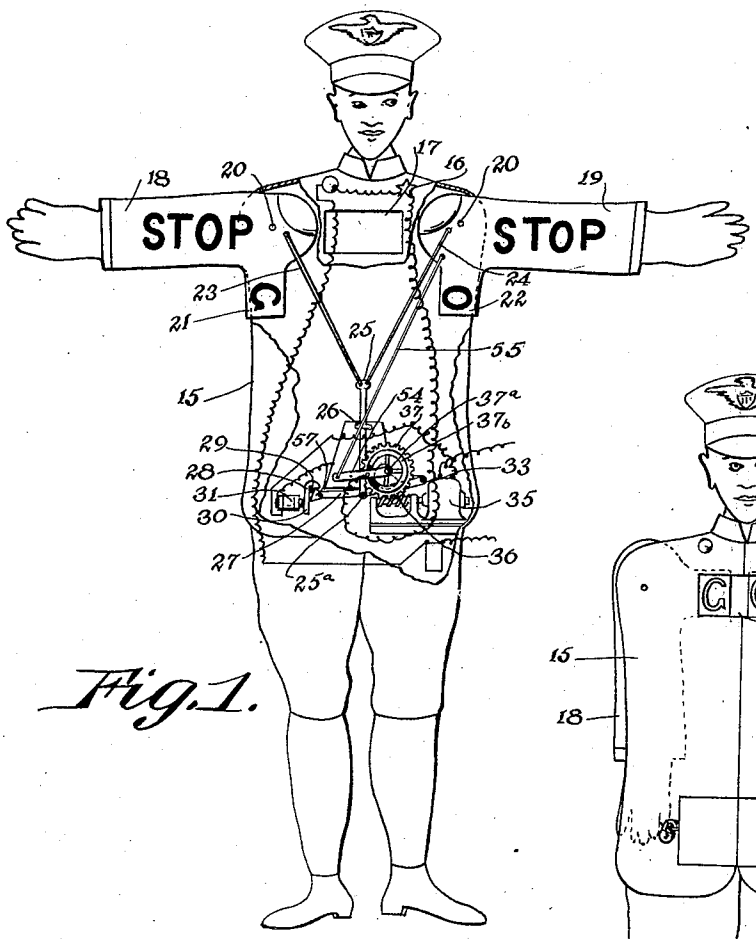


Fig. 1.

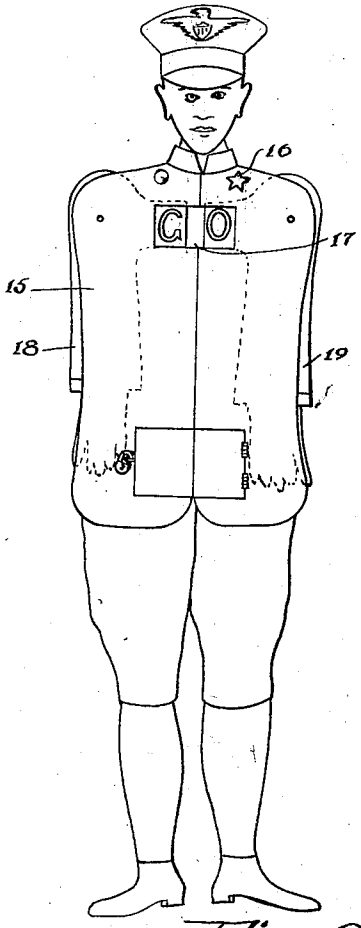


Fig. 2.

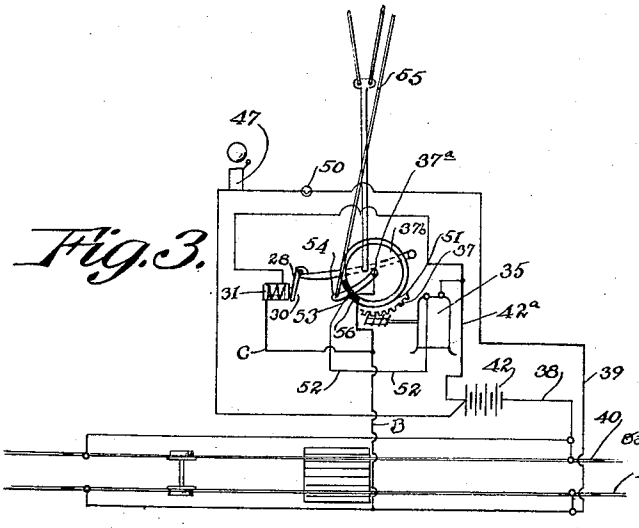


Fig. 3.

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Fig. 4.

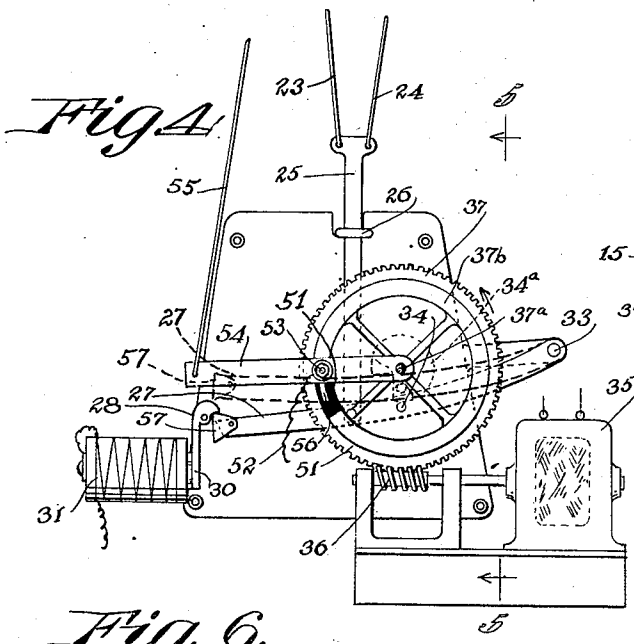


Fig. 5.

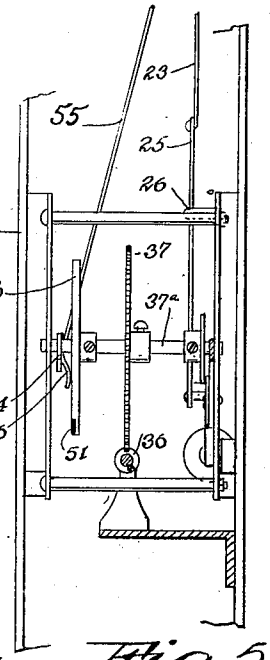


Fig. 6.

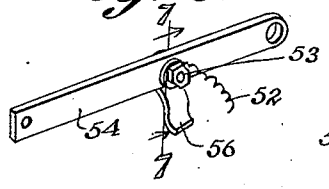


Fig. 7.

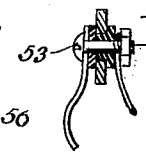


Fig. 8.

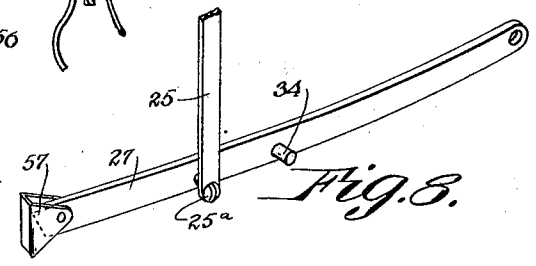


Fig. 9.

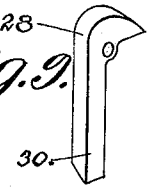
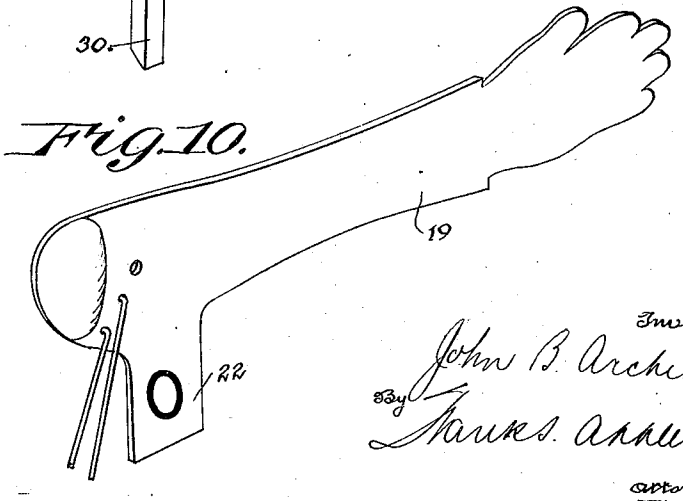


Fig. 10.



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Patented May 28, 1929. 1,715,265

UNITED STATES PATENT OFFICE.

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SIGNALING DEVICE.

Application filed April 30, 1923. Serial No 635,698.

This invention relates to signals of the semaphore type, and to novel means whereby semaphore arms may be mechanically operated through electrically controlled circuits and electrically operated mechanism; the said invention having for an object the provision of novel means whereby a circuit may be established by a train for operating a semaphore at a crossing or the like, in order that the arms of the semaphore will be extended to warn travelers on the road of the approach of the train.

It is furthermore an object of this invention to produce a signaling device simulating a man, the arms of which are extended as semaphore arms and which are capable of moving to an approximately vertical position when the road is clear and traffic is to be uninterrupted.

It is a further object of this invention to produce a semaphore of the character indicated which is effective and alike on both sides, that is to say, both sides will represent the figure of a man, the arms of which oscillate and a warning can be therefore given from either side.

It is a further object of this invention to provide novel arm operating devices effective to swing the arms outwardly when a motor is energized by the establishment of the circuit, the said device being operative to retain the arms in their extended position a predetermined time, or until the mechanism is tripped through the de-energization of a magnet that controls a detent, the latter of which is operative to hold the parts in their set positions with the arms extended.

With the foregoing and other objects in view, the invention consists in the details of construction, and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 illustrates a view in elevation of a semaphore or signaling device embodying the invention, the casing of which is broken away to show the interior mechanism;

Figure 2 illustrates a view in elevation of the opposite side of the semaphore in its normal position;

Figure 3 illustrates a diagrammatic view of the circuit by which the mechanism is controlled;

Figure 4 illustrates an enlarged detail view in elevation of the motor and parts associated with it;

Figure 5 illustrates a sectional view on the line 5—5 of Fig. 4;

Figure 6 illustrates a perspective view of a lever and brush associated therewith;

Figure 7 illustrates a sectional view on the line 7—7 of Fig. 6;

Figure 8 illustrates a perspective view of a lever and a member connected to it;

Figure 9 illustrates a perspective view of a dog in coactive relation to the lever shown in Fig. 8; and

Figure 10 illustrates a perspective view of one of the semaphore arms with links connected to it.

In these drawings, 15 denotes the semaphore casing or standard which is shaped to simulate the outline of a human figure, and it is preferably provided with the outline of a cap at the top to represent an officer. The casing has apertures 16 through which light may be exposed, the said apertures being in the nature of a star or badge. The casing is further provided with apertures or windows 17, through which the signal "GO" is exhibited when the semaphore arms are in normal position, as will presently appear. These apertures are, of course, duplicated on the two sides of the figure, so that the same signal will be exhibited in two directions.

The semaphore arms 18 and 19, which simulate the arms of a person, are oscillatably mounted on pivots 20 that are secured in the casing in any appropriate way, and the arms have angularly disposed extensions 21 and 22, respectively, beyond the pivots, that are exposed at the windows or openings 17 when the arms are in a lowered position. These extensions are lettered and the former has the letter "G" on one side depicted on it, and the latter the letter "O" on one side, so that when the arms are in operative position, the word "GO" will appear at the openings 17. For the reverse side, the letters are, of course, in reverse order to insure that they will be read correctly from the other side.

Links 23 and 24 are pivotally connected to the respective arms 18 and 19, and these links have their inner ends connected to a reciprocatory pitman 25, which latter moves approximately vertically in a guide 26 on the inside

of the casing. A pintle or pin 25ª extends through the pitman and a lever 27 and pulls the links downwardly when the semaphore arms are to be raised to approximately horizontal positions, it being understood that the weight of the arms is sufficient to cause them to resume their normal positions when they are released, as will be presently explained.

The links 23 and 24 are shown as pivoted to the inner ends of the arms 18 and 19 inside of the location of the pivots 20 for the arms in order that when the arms are lowered and their inner ends are raised, they will exert a pull on the links to restore some of the parts to normal operative positions.

A detent or dog 28 is oscillatable on a pivot 29, and it has an extension or tail 30 that is in operative relation to a magnet 31 in order that when the magnet is energized, the extension will be drawn toward the magnet and the dog will be held in engagement with the lever. The extension 30 is of sufficient weight to hold the dog normally out of the path of travel of the lever, but the power of the magnet when energized, swings the dog into engagement with the lever and holds it so long as current is supplied to the magnet.

The lever is mounted on a pivot 33 and it has a pin 34 that is engaged by a cam 34ª that forces the lever downwardly when the motor 35 is energized; it being shown that the motor is associated with a worm 36 which it drives and the worm in turn rotates the toothed wheel 37 which it engages, and the said toothed wheel is on the shaft 37ª that also has the cam 34ª. Hence, when current is established through the motor, the cam is rotated, and engaging as it does the pin 34, the lever is depressed to the position in which it is shown in Fig. 1 and the dog engages the lever to retain the parts in their operative positions. Upon the deenergization of the magnet, however, the dog releases the lever and the parts then assume their normal positions.

The conductors 38 and 39 may lead to any suitable switch at a distance from the signal, it being the intention of the inventor that the said switch shall be closed by a train passing over the track, identified by the rails 40 and 41, although any suitable switch and any suitable switch closing means may be employed. The conductor 38, in this illustration, connects the rail 40 with one pole of the battery 42, and the conductor 39 is connected to the rail 41 and to the other pole of the battery. The said conductor 39 includes in the circuit, a lamp 50 which is displayed at the aperture 16 and the audible signal 47, which is in the nature of an electric bell.

The rail 41 has a conductor B leading from it to the shaft 37ª of the wheel 37ᵇ, and when circuit is established, the wheel 37ᵇ is energized. The conductor 42ª establishes a connection from the battery 42 to the motor and to the magnet 31. A conductor C leads from one pole of the magnet 31 to the conductor B, and the magnet will be energized so long as the train is on the rails, as will be seen from the wiring diagram.

As stated, the casing is provided with a bell 47 which is also in circuit with the battery through the conductor 39 and the bell is energized at the time the semaphore arms are lifted.

The wheel 37ᵇ has an insulated segment 51 on its side, whereas the remainder of the side of the said wheel is a conductor of electricity. The conductor 52 is in circuit with the motor and it is connected to a terminal 53 on the lever 54, which lever 54 has a link 55 connecting it to one of the semaphore arms in order that the motion of the semaphore arm will be communicated to the lever and oscillate it on its pivot, which pivot, in the present embodiment of the invention, is the shaft of the wheel 37ᵇ. The terminal 53 has a brush 56 connected to it, and this brush is carried downwardly into engagement with the insulation when the wheel 37ᵇ has rotated to a position to raise the semaphore arms. When this occurs, the circuit through the motor is interrupted and the driving operation of the motor is discontinued.

When the arms are elevated, the arrangement of the circuit is such that the magnet will be energized and cause the dog to engage the shoe 57 on the lever 27, a relation of parts which will cause the latch to hold the arms normally elevated. The brush 56 is insulated from the lever 54 and a circuit is established through the motor when the brush is on that part of the wheel 37ᵇ which is conductive. As the semaphore arms descend, the arrangement of parts is such that the brush leaves the insulated segment of the wheel 37ᵇ, and when it does so, a circuit will be established when a car has reached that portion of the track constituting the block for establishing a circuit through the motor.

It will be apparent, therefore, that when a car is on the track that is blocked, the motor will be energized to an extent that it will drive the worm and gear to elevate the semaphore arms, and that when the device is operated a predetermined degree, the dog or latch will engage the shoe of the lever and retain the semaphore arms elevated. So long as the car is on the block, the magnet will be energized, whereas the current to the motor will be cut off. After the car has left the block, current will cease to be delivered to the magnet, and it will release the dog and the operative parts of the device, and they will be reset for another operation of the device when a car reaches the block.

As the operation of the device or the elements thereof has been stated in connection with a description of the elements, it is believed unnecessary to furnish a résumé of the operation of the mechanism or device, since

one skilled in the art will, it is thought, understand the same from what has been said.

I claim:

In a semaphore signal, an oscillatably mounted semaphore member, a link extending therefrom, an oscillatably mounted lever to which the link is connected, an electric motor driven wheel having an insulating segment, a contact on the lever engageable with a surface of the wheel and the insulating segment, a source of electricity and a circuit for the said motor including the said wheel and the said lever, an oscillatably mounted lever associated with means whereby movement of the aforesaid wheel is communicated to the lever, an electrically controlled means for holding the last mentioned lever out of the path of travel of the aforesaid lever moving means, and means for connecting the said lever to the semaphore arm whereby movement of the semaphore arm is imparted to the lever when said lever is released.

JOHN B. ARCHIBALD.