Jan. 2, 1923.

1,440,878

L. H. LEE.
TRAIN LIGHT.
FILED JUNE 25, 1921.

2 SHEETS-SHEET 1

Fig. 6.

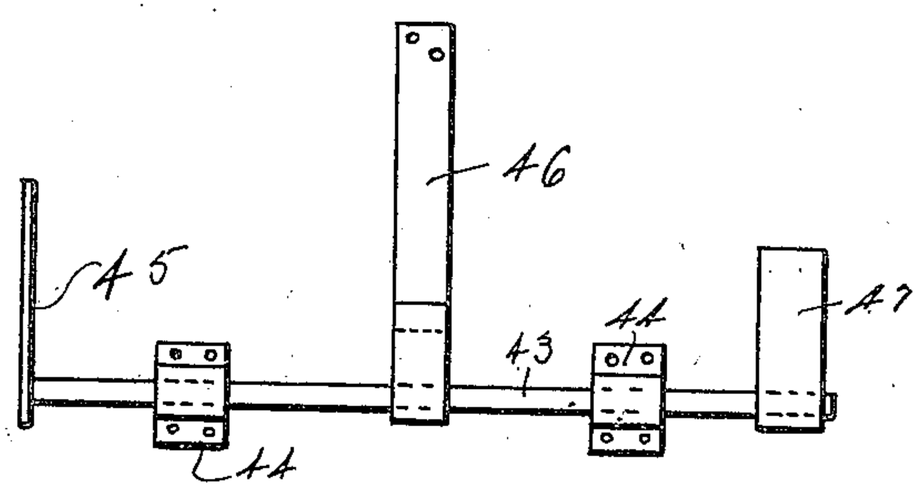


Fig. 1.

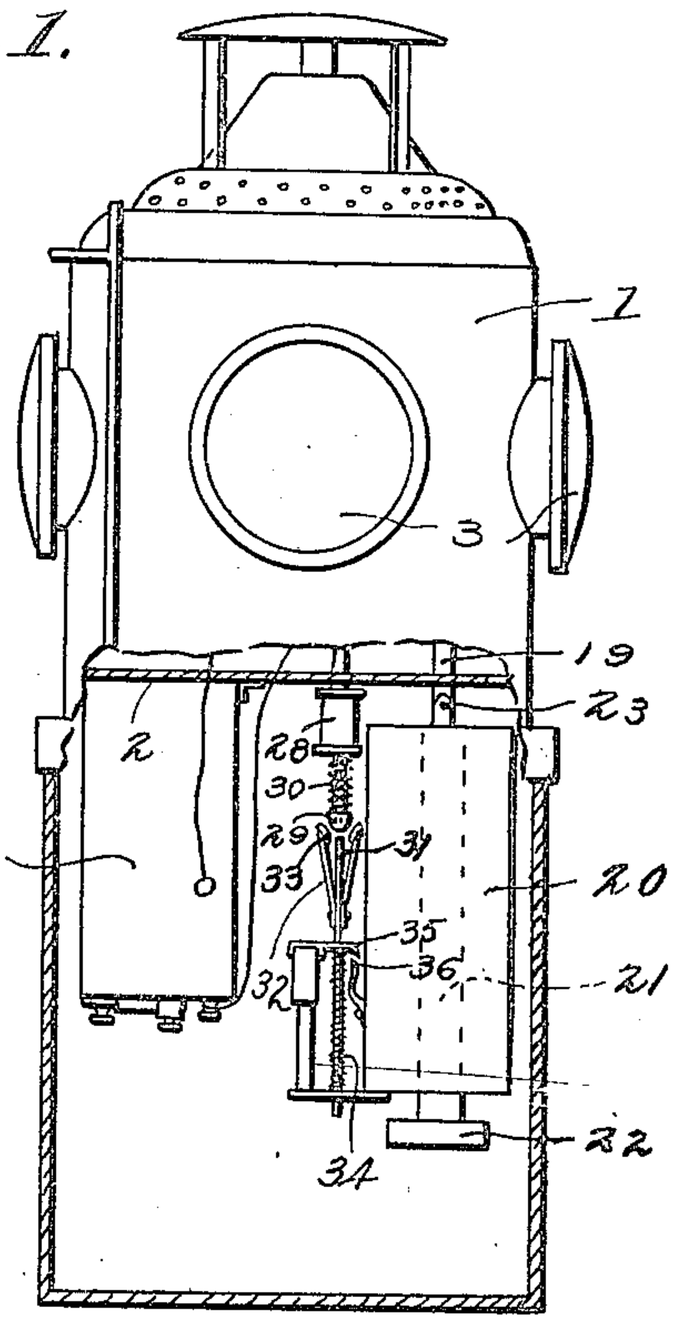


Fig. 7.

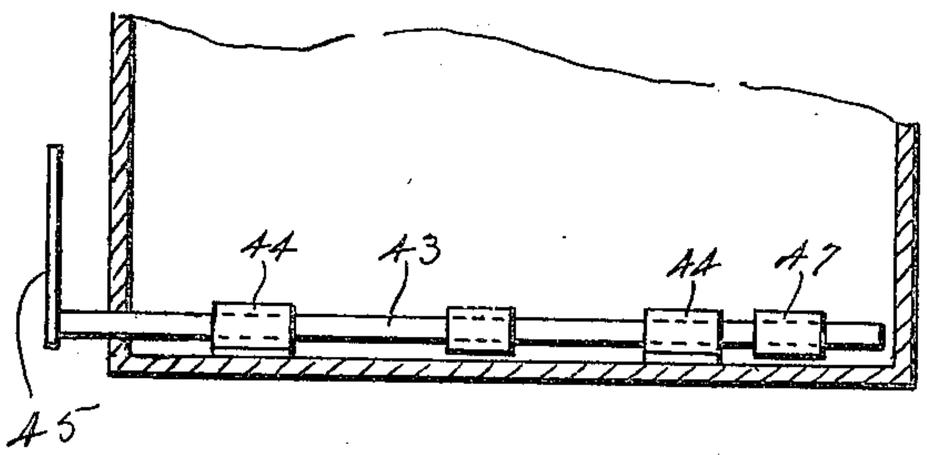
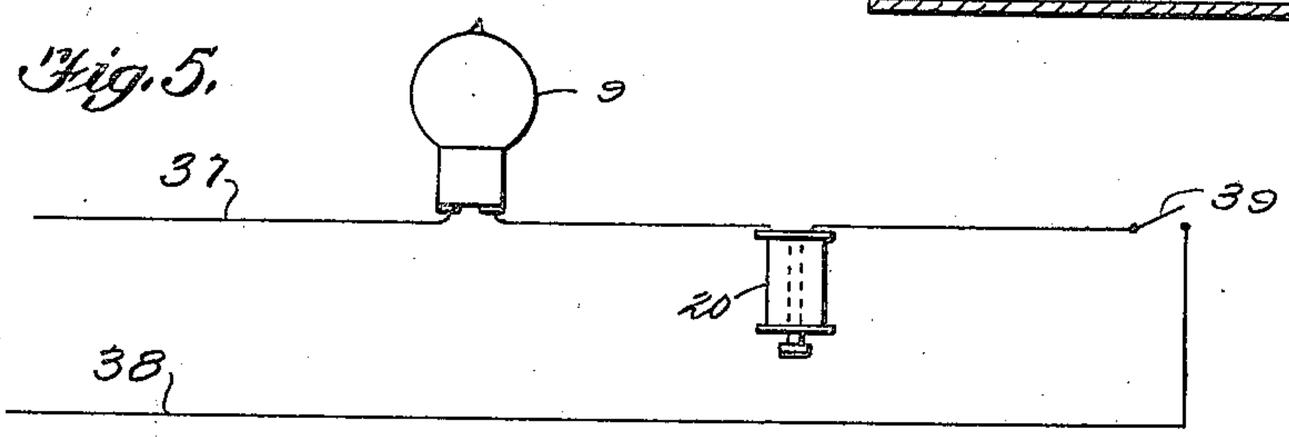


Fig. 5.



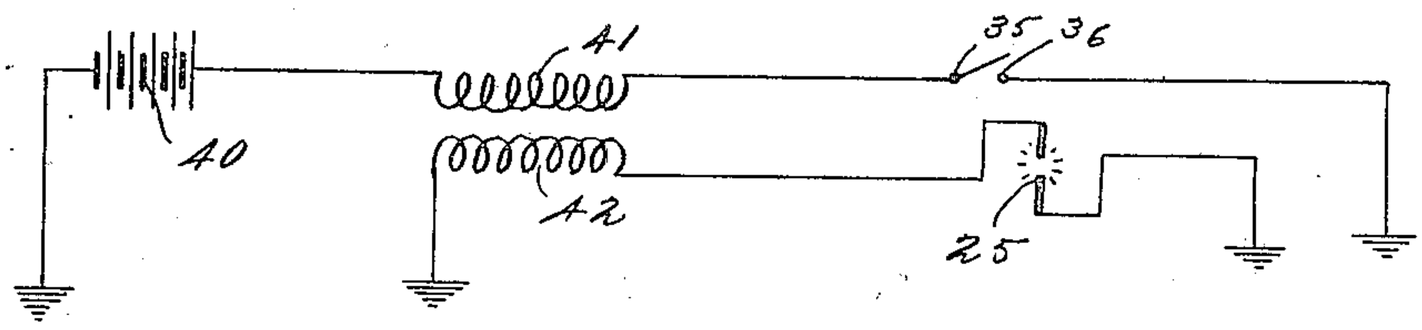


Fig. 4.

Inventor
L. H. Lee.

By F. P. Lorin

Attorney

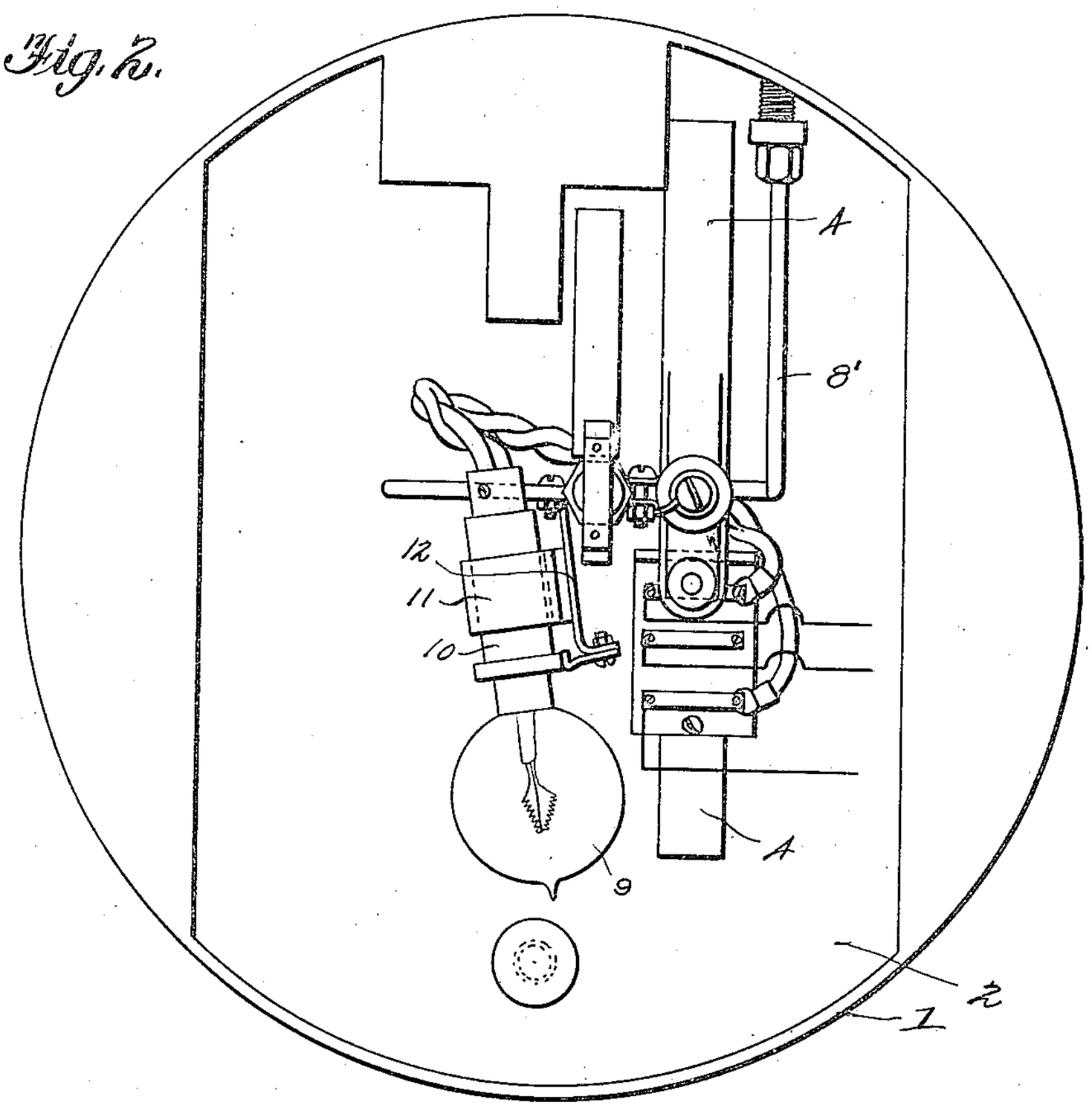
Jan. 2, 1923.

1,440,878

L. H. LEE.
TRAIN LIGHT.
FILED JUNE 25, 1921.

2 SHEETS-SHEET 2

Fig. 2.



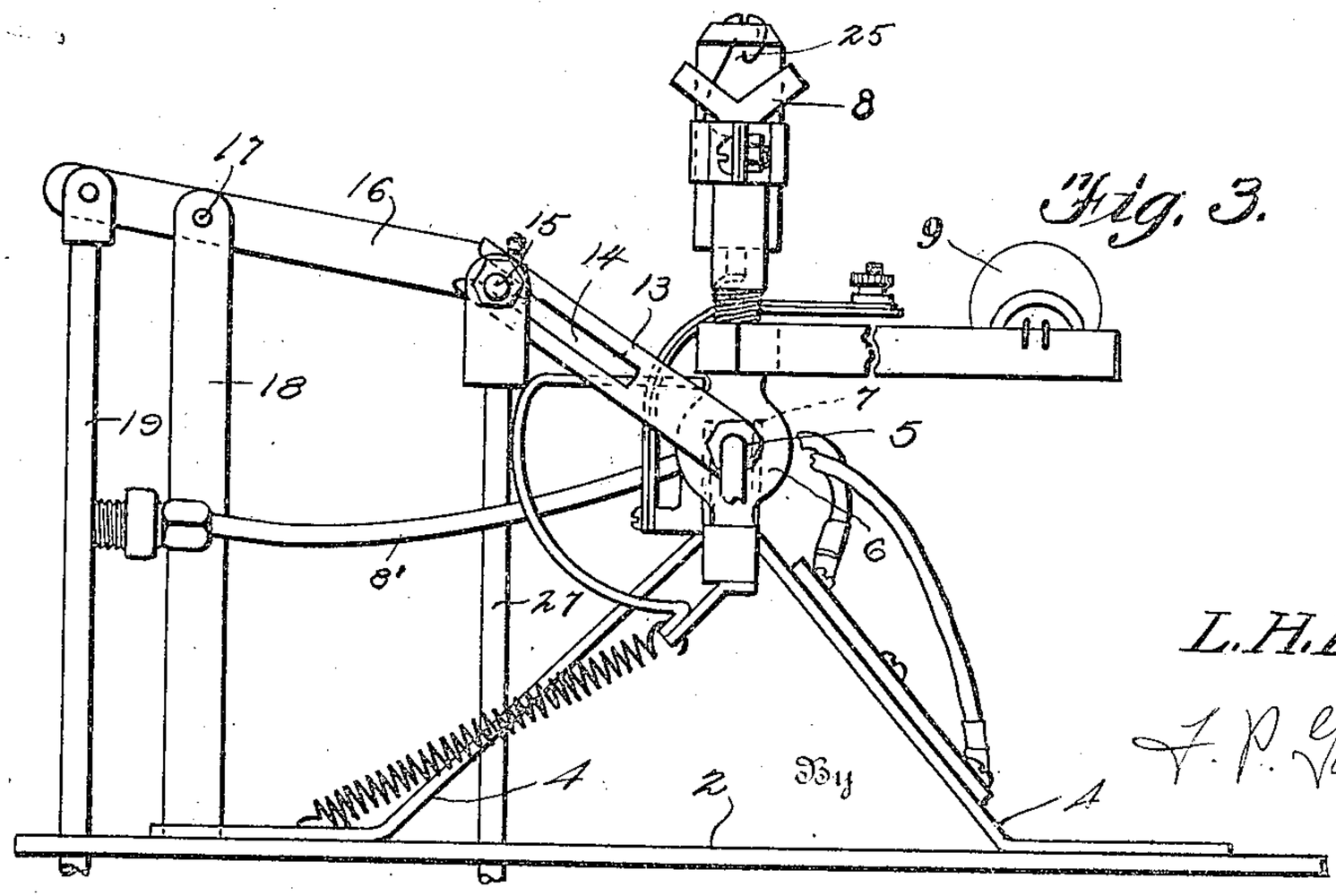


Fig. 3.

Inventor
L. H. Lee.
By F. P. Lorin
Attorney

Patented Jan. 2, 1923. 1,440,878

UNITED STATES PATENT OFFICE.

LAWRENCE H. LEE, OF TACOMA, WASHINGTON.

TRAIN LIGHT.

Application filed June 25, 1921. Serial No. 480,385.

To all whom it may concern:

Be it known that LAWRENCE H. LEE, a citizen of the United States, and residing at Tacoma, in the county of Pierce and State of Washington, has invented certain new and useful Improvements in Train Lights, of which the following is a specification.

This invention relates to an improvement in signal lamps, adapted more particularly for use on railroad trains.

The objection to the use of electric current for such lamps is, that such current is liable to failure or the bulb liable to turn out, and as it is absolutely essential that the signal lamp be kept burning at all times required for use, universal recourse has been had to the usual oil as a source of illumination for such lamps.

The present invention is directed to a signal lamp designed particularly as an electric lamp, the lamp including however, a burner for gas supplied from a suitable tank or reservoir, with the construction such that in the event of failure of the electric illumination for any purpose, the gas burner will be automatically shifted to the proper illuminating point, the gas ignited, and maintained until the electric current is restored, whereupon the gas is automatically cut off, the burner shifted from the illuminating position, and the electric bulb properly positioned to furnish the source of illumination.

In the drawings:

Fig. 1 is a view in elevation partly in section of the improved lamp.

Fig. 2 is a horizontal section taken thru the illuminating chamber, the operating parts being omitted.

Fig. 3 is a side elevation of the same.

Fig. 4 is a diagram of the circuit for the gas burner ignition.

Fig. 5 is a diagram of the circuit for the energizing of the electric control and illumination.

Fig. 6 is a view in partial section of the bottom of the casing, showing the indicator in plan.

Fig. 7 is a side elevation of the same.

The improved signal lamp comprises a lamp casing 1, which for the purpose of the present invention, is divided by a transverse partition 2 into an upper or illuminating chamber and a lower or mechanism chamber. The casing in the upper portion is provided with the usual lenses 3, and rising from the partition 2 within the illuminating chamber are brackets 4. The shaft 5 is fixedly supported in brackets 4, and on this shaft is mounted a valve casing 6. The casing is mounted for rotation about the shaft, and contains a valve mechanism 7, with which communicates a gas supply pipe 8′, leading from any suitable source of supply. Carried by the valve casing 6 is a gas burner 8, and also projecting from the valve casing at an angle to the gas burner, is an electric bulb 9, the latter being removably mounted as usual in a socket 10 supported in a clip 11 connected by strips 12 to the valve casing.

In the automatic operation of the structure to be hereinafter described, it is designed that either illuminating means, gas or electric light, in use at the particular time, shall occupy an advantageous position with respect to the lenses 3, the mechanism thus shifting the gas or electric bulb, as the case may be, into that advantageous position according to which particular illuminant is to be used. Obviously, the valve 7 is controlled in the shifting of the casing 6, so that when the gas burner is upright, or in the illuminating position, the valve will be open to admit gas to said burner, while when the valve casing has been shifted to move the electric bulb into the upright or illuminating position, the valve is closed to cut off the supply of gas.

The valve casing 6 is shifted about the shaft support 5 by an arm 13 slotted at 14 to receive a pin 15 projecting from one end of an operating lever 16. The lever 16 is pivotally mounted at 17 upon an upright 18 rising from the partition 2, the short end of the lever beyond the pivotal mounting being connected to a rod 19, which is operative thru the partition.

Arranged below the partition is a solenoid 20 and a core 21 thereof is provided at the lower end with a head 22 and is connected at the upper end at 23 with the lower end of the rod 19. Thus, when the solenoid is energized, the rod 19 will be at its upper limit of movement, in which position, the electric light bulb will be in illuminating relation to the lenses. Upon the deenergization of the solenoid, the core will drop by gravity, operating the lever 16 to shift the gas burner into operative position. That is to say, the parts will be in the positions illustrated in Fig. 3.

A spark coil 24 is also secured to the par-

tition 2, one secondary lead being grounded and the other leading to and thru a spark gap 25, arranged adjacent the illuminating position. A primary circuit make and break for the spark coil is operated thru a rod 27 connected to the end of lever 16 carrying the pin 15. Rod 27 is hollow and projects thru the partition 2 and provided below said partition with a trip sleeve 28 slidably mounted upon the rod, and below said sleeve with a conical head 29 also slidably mounted on the rod with a spring 30 interposed between the head and sleeve. The rod 31 is mounted in suitable guides projecting, for example, from the solenoid and is adapted to slidably enter the rod 27 as the latter is moved downwardly. This rod 31 carries spring arms 32 formed at the upper end with projections 33 to engage and lock with the head 29 of the rod 27 when said rod is depressed. As the rod 27 is lowered in the automatic operation of the device to utilize the electric current as the illuminant, the head 29 is engaged by the projections 33 on the spring arms 32, the rod 31 entering the rod 27. On the reverse operation, rod 27 moves upwardly when positioning the gas burner as the lamp illuminator, until the trip sleeve 28 is stopped by the partition 2. The movement of the rod 27 continuing however, the sleeve forces the arms 32 apart, releasing the head 29, and permitting a spring 34 connected to the rod 31 to move the rod sharply downward. Primary contacts 35, 36, are thus brought momentarily into contact to make and break the primary circuit of the spark coil, this make and break occurring just as the spark gap of the burner is in sparking position.

In Fig. 5, the diagrammatic circuit for the use of electricity as an illuminator, is shown to comprise conductors 37, 38, leading from the train source of electric current thru the lamp 9 and solenoid 20. This circuit may, if desired, include a hand switch 39, by which the control of the current may be had for initial uses of the lantern. In Fig. 4 is shown the ignition circuit for the gas burner, wherein one side of the battery 40 is grounded, the other side leading thru the primary 41 of the spark coil, the contacts 35, 36, and to ground. The secondary 42 of the coil is grounded at one side and leads thru the spark gap 25 and then to ground.

From the above description, it will be obvious that so long as the train circuit remains in tact, the signal lamp will be lighted by electricity. Under these conditions, the solenoid will be energized, and the rod 19 maintained in its upward limit of movement. If however, the current fails or the lamp burns out, the solenoid is deenergized, the core 21 moves downwardly by gravity, the lever 16 is operated, the arm 13 moved, and the valve casing 6 turned on its axis 5. This operation moves the gas burner into illuminating position, at the same time opening up the gas supply. As the rod 27 moves upwardly in this operation, the primary of the spark coil is energized in the manner previously described, and a spark is generated at the gap 25 to ignite the gas issuing from the burner 11.

If the train current is re-established, the solenoid is again energized and the parts moved in an obvious manner to shift the electric bulb into illuminating position, cut off the gas from the burner 11, and move said burner out of illuminating position.

It is deemed advisable, though not essential, that an indicator be arranged on the signal lamp to advise the trainmen as to whether the lamp is illuminated by electricity or gas. To secure this result, there is arranged in the bottom of the casing a shaft 43 mounted in bearings 44 and projecting thru one wall of the lamp casing, being provided on its projected end with an indicator or pointer 45. A spring 46 is connected to the bottom of the lamp casing and cooperates with the shaft 43 to hold the latter normally in a position to indicate that the lamp is being illuminated by the electric current. An arm 47 is secured to one end of the shaft in line with the head 22 of the solenoid core 21. Thus, as the electric current fails and the core drops by gravity, the head 22 will engage the arm 47 and turn the shaft 43 against the tension of the spring 46, moving the indicator 45 to a position to indicate the use of the gas as an illuminant. The parts will remain in this position until the electric current is restored.

Claims:

1. In a signal lamp, an electric source of illumination, a gas burner, a solenoid controlled by the current energizing said electric source of illumination, means controlled by the solenoid to reversely shift the electric source of illumination and gas burner with respect to the illuminating point in the lamp and in accordance with the current to the solenoid.

2. In a signal lamp, an electric source of illumination, a gas burner, a solenoid controlled by the current energizing said electric source of illumination, means controlled by the solenoid to reversely shift the electric source of illumination and gas burner with respect to the illuminating point in the lamp and in accordance with the current to the solenoid, and sparking means for the gas burner automatically controlled during such shifting.

3. In a signal lamp, an electric light, a gas burner, a supply of gas for said burner, a circuit for the electric lamp, a solenoid in said circuit, means operating thru the

energization and de-energization of the solenoid to change the positions of the electric lamp and gas burner with respect to the illuminating point in the lamp, said means controlling the gas supply to the gas burner.

4. In a signal lamp, an electric light, a gas burner, a supply of gas for said burner, a circuit for the electric lamp, a solenoid in said circuit, a core in the solenoid, levers operated in the movement of the core, a valve casing controlling gas admission to the burner, said casing carrying the burner and electric lamp, and connections from said valve casing to be operated by said lever to reversely position the gas burner and lamp.

5. In a signal lamp, an electric light, a gas burner, a supply of gas for said burner, a circuit for the electric lamp, a solenoid in said circuit, a core in the solenoid, levers operated in the movement of the core, a valve casing controlling gas admission to the burner, said casing carrying the burner and electric lamp, and connections from said valve casing to be operated by said lever to reversely position the gas burner and lamp, a local circuit, a spark coil of which the local circuit forms the primary, a spark gap for the gas burner energized by the secondary of the spark coil, and means operated by said lever to make and break said local circuit.

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

LAWRENCE H. LEE.

Witnesses:

ULDRA ERICKSON,

E. D. NICHOLS.