

May 2, 1944.

J. LA ROCCA

2,347,784

WARNING SIGNAL

Filed July 14, 1941

2 Sheets-Sheet 1

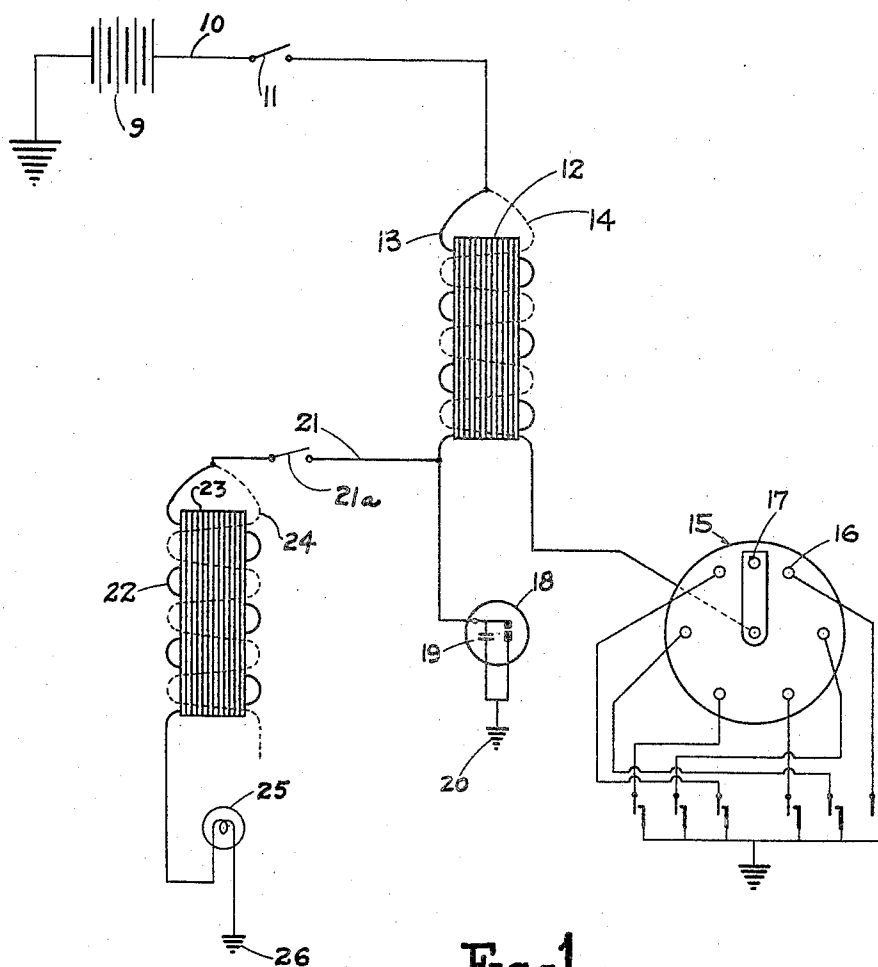


FIG. 1

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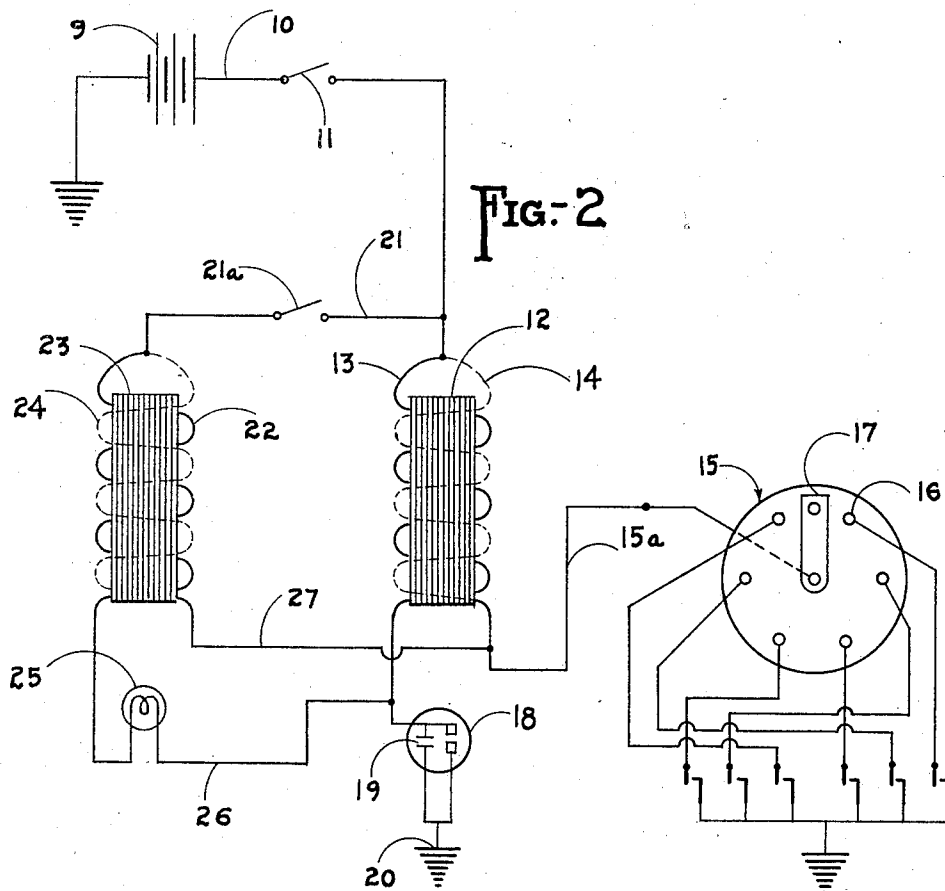
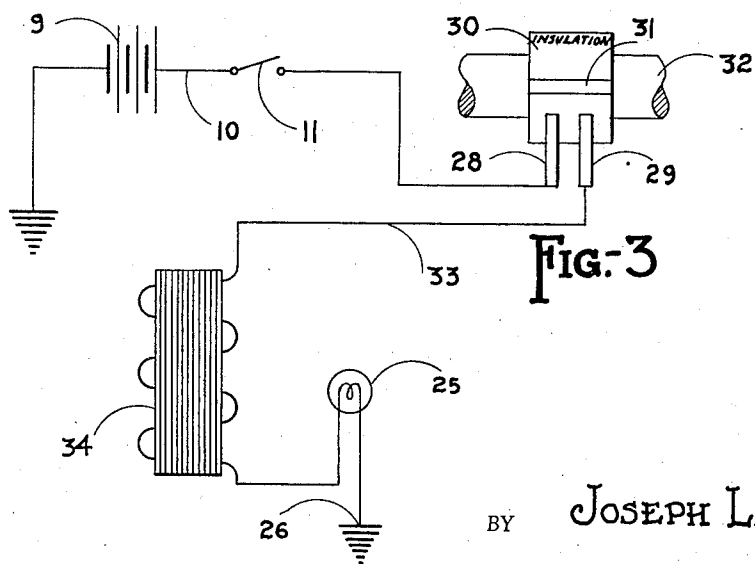
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UNITED STATES PATENT OFFICE

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WARNING SIGNAL

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Application July 14, 1941, Serial No. 402,288

1 Claim. (Cl. 177—311.5)

This invention relates to electrically operated signaling systems, and has for its principal object to provide a system of the type wherein a warning lamp is so interconnected with a variable-speed element in said system as to produce a visible flickering effect whenever the speed of said element falls to a predetermined point.

I accomplish the foregoing object and other and more limited objects to be set forth hereinafter in and through the use, with an electric lamp and an electrical circuit including said lamp, of an interrupter in said circuit which is operated in timed relation with respect to the speed of the said element, whereby the lamp will produce a flickering effect which is visible to the human eye when the said element is operating at low speeds and which will not be visible to the human eye when the said element is operating at higher speeds. In practice, I have used a 3 c. p. 7 volt lamp bulb. Such a bulb draws a current of 0.64 ampere and has given satisfactory results.

In the drawings hereof I have shown three modes of realizing my invention. Fig. 1 is a schematic view showing the manner in which my invention may be connected with the ignition system of an automobile so that the lamp will produce a flickering warning effect when the engine speed falls below a predetermined limit; Fig. 2 a view similar to Fig. 1, showing a different manner of connecting the lamp with the ignition system; and Fig. 3 a view showing the manner in which the lamp may be used in connection with a variable speed element, such as the shaft of a machine.

In the embodiment of my invention shown in Fig. 1, 9 represents a battery such as automobiles are usually provided with; 10 the lead from the battery; 11 the ignition switch; 12 the core; 13 the primary winding and 14 the secondary winding of a standard ignition coil, the secondary winding of which leads to the usual distributor 15 provided with the usual contact points 16 and the contact arm 17. The lead from the primary winding is connected to the circuit breaker 18, including the condenser 19 and ground 20. The parts thus far described are such as constitute standard equipment for automobiles.

The lead from the primary winding 13 is also connected by a conductor 21 with a winding 22, which may be the primary winding of an ignition coil substantially identical with the former ignition coil, but which may be substituted by the winding of an ordinary choke coil. In actual practice, I have connected the lead from the primary winding 13 with the primary winding of a

standard ignition coil having the core 23 and secondary winding 24, and have obtained satisfactory results therefrom. The lead from the primary 22 is shown as connected with the filament of a signal lamp 25, which is shown as grounded at 26.

With the parts constructed and arranged as described, the operation will be as follows: With the ignition switch closed, current will be delivered from the ignition coil to the distributor and breaker in the usual manner. With the breaker points closed, practically no current will flow to the signal lamp through the coil 22 because the current will follow the path of least resistance, which will be to the ground 20. However, immediately upon the separation of the breaker points, the current will flow to the lamp during the short interval between the separation of the breaker points and the quickly following discharge of the condenser, and also during the very short period after the condenser has discharged and before the breaker points are again in contact. During the actual discharge period of the condenser, no current from the battery can flow through the winding 22, since the current from the condenser flows through the primary 13 in the opposite direction. Furthermore, the reactance of the coil 22 and the resistance of the lamp 25 will, it is believed, prevent the surge of the condenser charge from passing through the former. However, should a small amount of the condenser discharge follow the high resistance path through the primary 22 and the lamp 25 to the ground 26, this occurrence does not interfere with the normal functioning of the ignition system and does not create a perceptible glowing of the lamp filament. Hence, during this discharge period, the signal lamp will be inoperative. A switch 21^a may be provided in the conductor 21 whereby the second ignition coil and the lamp 25 may be thrown out of circuit.

From the foregoing, it follows that, when in use, the lamp will produce a flickering effect which is perceptible to the eye only when the engine speeds, and consequently the vibration periods of the breaker, are comparatively low. However, when the engine is running at higher speeds, the lamp will give a glow without any perceptible flicker, due to the high frequency of the interruptions of the current. This tendency to produce a glow without any perceptible flicker when the engine is running at high speeds is enhanced by the fact that the characteristic ability of the inductance or reactance coil to level out current pulsations is increased as the number of pulsations per

unit of time is increased. When the reactance coil 22 is the primary winding of a spark coil, the secondary winding of the same may be used for emergency or auxiliary purpose.

In Fig. 2 I have shown a signaling system which differs from that shown in Fig. 1 in that the primary 22 of the second coil is in series with the light 25 and the said primary and light are in parallel with the primary 13 of the first coil through the leads 21 and 26. Furthermore, by means of the leads 21 and 27, the secondary 24 of the second coil may be connected in parallel with the secondary winding 14 of the first coil, where it is desired to increase the intensity of the spark.

In the system shown in Fig. 2, the circuit to the lamp will be closed when the circuit breaker points are closed. If desired, the lead 21 may be provided with a switch 21^a whereby the second coil and lamp may be put out of circuit. With the lamp in circuit, it will function in substantially the same manner as the lamp shown in Fig. 1; in both instances, the lamp will produce a flickering effect which is perceptible to the eye only when the engine speeds, and consequently the vibration periods of the breaker, are comparatively low, but when the engine is running at higher speeds, the lamp will give a glow without any perceptible flicker, due to the high frequency of the interruptions in the current.

In Fig. 3 I have shown the manner in which the lamp 25 will function to indicate when the speed of a movable element is reduced beyond certain predetermined limits. The source of current (indicated as a battery 9) is connected by a lead 10 and switch 11 with one of two contact fingers 28 and 29 bearing upon a cylinder 30 of insulating material having one or more strips of current conducting material 31 extending thereacross and adapted to be engaged by said contacts, the said cylinder being mounted upon a rotating shaft 32. The contact 29 is connected by the line 33 to one of the contacts of the lamp 25, the other contact of which is connected to the source of power, such connection being indicated by the ground 26. If desired, a choke coil 34 may be included in the circuit.

It will be evident that, with the parts arranged as shown and described, if the speed of the movable element (in this case the speed of rotation of the shaft 32) falls below a certain predetermined safe or desirable rate, a visible flicker will

be produced in the lamp 25, but no such visible flicker will be produced if the speed of the movable element is such as to render it unnecessary to give any warning indication.

It will be evident, from the foregoing, that I have produced a signaling system which is simple and economical of production, but which will function effectively, when combined with the ignition system of an automobile, to give timely warning when the speed of the vehicle so equipped is about to be reduced and thereby enable the driver of a car immediately behind the one so equipped to prepare to take appropriate action. Furthermore, the signals given by the lamp are not dependent upon the application of the brakes, which is the customary mode of operating a warning signal lamp.

It will be evident that my signaling system can also be so incorporated with the shafts or other movable elements of machinery as to enable timely warning to be given whenever the rate of movement or rotation of said elements is so reduced as to render their operation unsafe or at least undesirable.

Having thus described my invention, what I claim is:

The combination, with an ignition system of an automotive vehicle, said system including a battery, an ignition coil having a primary and a secondary winding, a distributor, a circuit including the secondary winding and the distributor, a circuit breaker, a circuit including the battery, the primary winding and the circuit breaker; of a second coil having a primary winding and a secondary winding, a signal lamp, a lead from one end of the primary winding of the second coil to said lamp, means for connecting the primary winding of the second coil and the lamp in parallel with the primary winding of the first coil and for connecting the secondary winding of the second coil in parallel with the secondary winding of the first coil, and means for varying the periodicity of the circuit breaker throughout the entire range of speed of the engine, whereby the lamp will produce a flicker visible to the human eye only when the engine is driven at a low rate of speed and an apparently continuous light when the engine is driven at higher rates of speed.

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