H. A. MENZEL.

AUTOMATIC CIRCUIT CLOSER FOR MOTOR VEHICLE STARTERS.

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Fig. 1.

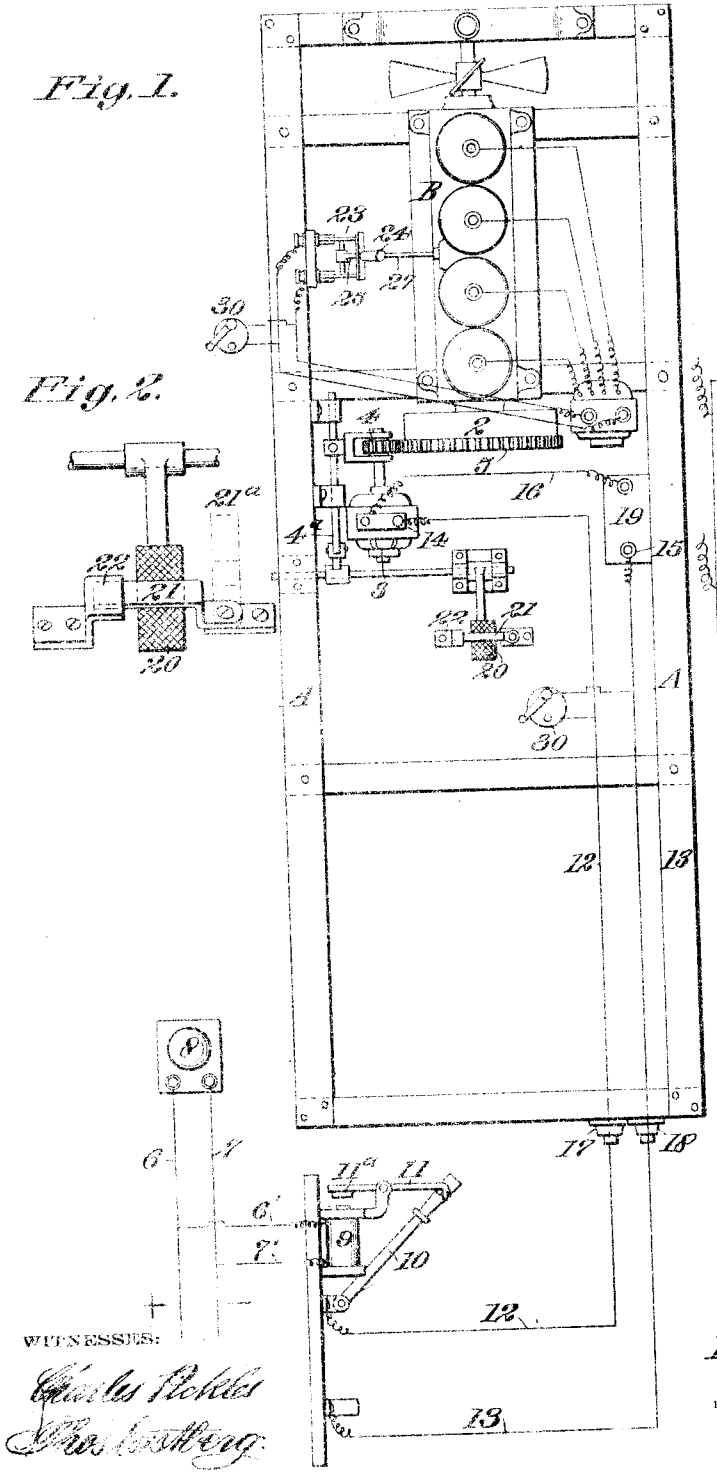
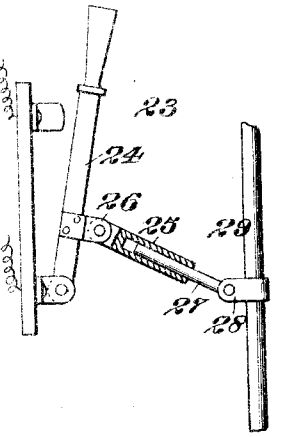


Fig. 2.

Fig. 3.



WITNESSES:

Charles Pickles

Geo. Gaffney

INVENTOR

Henry A. Menzel.

BY G. H. Strong.

ATTORNEY

UNITED STATES PATENT OFFICE.

HENRY A. MENZEL, OF SANTA CLARA, CALIFORNIA.

AUTOMATIC CIRCUIT-CLOSER FOR MOTOR-VEHICLE STARTERS.

1,086,682. Specification of Letters Patent. Patented Feb. 10, 1914.

Application filed November 5, 1913. Serial No. 799,325.

To all whom it may concern:

Be it known that I, HENRY A. MENZEL, a citizen of the United States, residing at Santa Clara, in the county of Santa Clara and State of California, have invented new and useful Improvements in Automatic Circuit-Closers for Motor-Vehicle Starters, of which the following is a specification.

This invention relates to an automatic circuit closer for motor vehicle starters.

In the use of motor vehicles, such as ambulances and apparatus of fire departments, it is desirable that the engine in such vehicles be started with the least possible delay when their use is required.

This invention is particularly applicable to such motor-driven vehicles as are provided with electric motor starters, and the object of this invention is to provide means for automatically closing the starting motor circuit on the vehicle when a fire alarm is received in the station.

Another object of the invention is to provide means for automatically closing the ignition circuit of the main engine when this is turned over by the starter.

Further objects will hereinafter appear.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which—

Figure 1 is a diagrammatic view showing the frame of the vehicle, internal combustion engine, electric starting motor with connected battery and the fire alarm circuit with connected mechanism for closing the circuit through the starting motor. Fig. 2 is a perspective view showing the latching mechanism employed for the purpose of holding the gear shifting pedal in depressed position. Fig. 3 is a side elevation of the ignition circuit closing switch and the means for automatically closing same.

Referring to Fig. 1 of the drawings, A indicates the frame of a motor vehicle, in this instance a motor-driven fire-engine; B the internal combustion driving engine of the truck; 2 the fly-wheel; and 3 the electric starting motor which is connected through a slidable driving pinion 4 with the gear 5 formed on or otherwise secured to the fly-wheel.

The main object of the invention is to automatically and instantaneously start the engine B through the electric starting motor 3 when a fire alarm is received within the fire station. This is accomplished in the following manner: 6 and 7 indicate the wires of the main fire alarm circuit connected with a bell 8, connected on said circuit, and operable in conjunction with same through wires 6′ and 7′ is an electromagnet 9 which becomes energized the moment the fire alarm circuit is closed to operate the bell and other connected mechanism. 10 indicates a trip switch which is adapted to be released by a latch member 11 the moment the magnet 9 becomes energized. The armature operable in connection with the magnet being secured to the inner end of the latch, as at 11^a, will thus cause the latch arm to rock and release the switch 10 which immediately drops and closes a circuit through wires 12 and 13. One of said wires, as 12, connects with one of the terminals of the starting motor, as at 14, while the other wire is connected, as at 15, with the starting battery on the truck. The other leg of the circuit is closed by a wire 16 which connects with the opposite terminals of the motor and battery. The wires 12 and 13 are connected through plugs 17 and 18 with the truck and will thus permit the truck to pull away from the plug connections 17 and 18 when leaving the fire station. The local circuit through the starting motor is thus broken and any necessity of severing connections between the motor vehicle and trip switch is thus entirely eliminated.

From the above description it can be seen that the moment a fire alarm signal is received in the station, magnet 9, which is connected on said circuit, will instantly become energized and release the trip switch 10 allowing this to close the local starting circuit through the battery 19 and motor 3.

By referring to the drawings it can easily be seen that the wires 12 and 13, together with the trip switch connected with the fire alarm circuit, becomes a stationary fixture within the fire station. It, therefore, becomes necessary, when returning to the fire station, to back the truck into such a position that plugs 17 and 18 may be inserted into the sockets on the vehicle for the purpose of connecting the circuit. The trip switch 10 is then raised into the upper open position where it remains until actuated by the fire alarm circuit.

Practically all vehicles equipped with an electric starting motor are provided with a

sliding pinion similar to the one here indicated at 4. This sliding pinion is operated through a pedal 20 which is adapted to throw it into and out of mesh with the gear 5 on the fly-wheel through a series of cranks and levers generally indicated at 4^a. The next operation, after the truck has been placed in position in the fire station and after plugs 17 and 18 have been inserted to connect the starting circuit, is to depress the pedal 20 so as to move the pinion 4 into mesh with gear 5. It also becomes necessary to hold the pedal in this depressed position as the pinion would otherwise move out of mesh with the gear the moment the pedal is released. The means for retaining the pedal in the depressed position consists of a swinging latch 21 which is adapted to be swung from the dotted line position indicated at 21^a across the foot lever 20 into engagement with a retaining latch 22. The foot lever is thus held in the depressed position and the pinion 4 prevented from sliding out of mesh with gear 5. The pinion 4 is thus in position at all times to start the engine B the moment the local battery circuit 1 is closed by the trip switch 10 and will thus cause the engine to be started when the fire alarm circuit is closed. For the purpose of automatically closing the ignition circuit through the spark plugs on the engine B the moment the starting motor 3 starts to turn the engine over, an automatic self-closing switch has been interposed on the ignition circuit of the engine, as indicated at 23. This switch is here shown as consisting of a standard form of knife switch 24 which is normally open when the engine is standing still, being manually placed in this position. 25 indicates a tube pivotally secured to the knife blade of the switch, as at 26, and 27 indicates a rod slidable in the tube which is pivotally secured, as at 28, to one of the valve operating lift rods 29 of the engine. The operation of this part of the mechanism will be as follows: The moment the engine starts turning over through the medium of the electric starting motor 3 it will only be a matter of about one revolution before the cam rod 29 will engage with the end of the rod and operate this to lift the connected inlet or exhaust valve whichever the case may be. Either an upward or a downward movement of the rod will thus be transmitted through the pivoted rod 27 and tube 26 to force the knife blade of the switch 23 into closed position; the length of the pivoted rod 27 being such as to engage with the bottom of the tube 25 or a stop secured therein the moment the rod 27 assumes a horizontal position with relation to the knife blade 24. The ignition circuit which remains normally open through the medium of the switch 22 when the engine is at a standstill is thus automatically closed the moment the engine starts turning over. From the previous description it can thus be seen that the engine is first started turning over through the dropping of the trip switch 10 which closes the local circuit through the starting motor 3, and secondly, through the automatic closing of the ignition circuit switch 23, and is thus running when the driver assumes his seat and throws in the driving clutches in the usual manner. The latch 21, holding the lever 20 in the depressed position for the purpose of holding the starting gears in intermeshed position, is then kicked out by the operator to permit the foot lever 20 to return to normal position; this movement being transmitted to disengage the pinion 4 from the gear 5. The local circuit established through the starting motor is then broken the moment the vehicle leaves the station as the plug connections 17 and 18 are severed by the vehicle when the vehicle moves away from same. Both the ignition circuit of the engine and the circuit through the starting motor are provided with the usual switches, as indicated at 30, for the purpose of closing said circuits when starting the engine outside of the fire station, these circuits being wired in the usual manner. It can thus be seen that the automatic starting circuits connected with the starting motor and ignition system are only secondary circuits provided for the purposes specified.

The engine starting motor and connected mechanism are constructed in the usual manner and require no special attachment outside of the auxiliary circuits, connections and switches described. The auxiliary mechanism constructed and connected as here shown is simple, reliable and positive in action and may be attached to any well-known type of motor driven vehicle provided with an electric starter.

I wish it understood that various changes in form, proportions and minor details of construction may be resorted to with relation to the automatic self-closing switches here employed and that I do not wish to limit myself to the specific design, construction and application as here shown.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. The combination with the electric starting motor on a motor vehicle and a fire alarm circuit, of means for automatically closing a circuit through the electric starting motor when the fire alarm circuit is closed.

2. The combination with the electric starting motor on a motor vehicle and a fire alarm circuit, of means for automatically closing a circuit through the electric starting motor when the fire alarm circuit

is closed, and means for automatically breaking the circuit through the electric starting motor when the engine is started.

3. The combination with a fire alarm circuit and a vehicle having an internal combustion driving engine and an electric starting motor connected therewith, of means on the fire alarm circuit for automatically closing the electric starting motor circuit, and means for automatically closing the ignition circuit on the internal combustion engine.

4. The combination with a fire alarm circuit and a vehicle having an internal combustion driving engine and an electric starting motor connected therewith, of means on the fire alarm circuit for automatically closing the electric starting motor circuit, means for automatically breaking said circuit, and means for automatically closing the ignition circuit on the internal combustion engine.

5. The combination with a fire alarm circuit and a vehicle having an internal combustion driving engine and an electric starting motor connected therewith, of a magnet connected with and actuated by the fire alarm circuit, and a trip switch actuated by said magnet adapted to close a local circuit through the electric starting motor to start the engine.

6. The combination with a fire alarm circuit and a vehicle having an internal combustion driving engine and an electric starting motor with connected battery, of a magnet connected with and actuated by the fire alarm circuit, wires connecting the starting motor and battery with socket members, plugs insertible in said socket members, wires extending from said plugs, and a trip switch connected with said wires adapted to close a circuit through the starting motor and battery actuated by the magnet on the fire alarm circuit.

7. The combination with a fire alarm circuit and a vehicle having an internal combustion driving engine and an electric starting motor connected therewith, of means on the fire alarm circuit for automatically closing the electric starting motor circuit, and means for breaking said circuit when the vehicle is moved.

8. The combination with a fire alarm circuit and a vehicle having an internal combustion driving engine and an electric starting motor connected therewith, of means on the fire alarm circuit for automatically closing the electric starting motor circuit, a switch on the ignition circuit of the engine, and means operated by the engine for automatically closing said switch when the engine is turned over by the starting motor.

9. The combination with a fire alarm circuit and a vehicle having an internal combustion driving engine and an electric starting motor connected therewith, of a gear on the engine, a sliding gear on the electric starting motor, means for holding the sliding gear in mesh with the gear on the engine, and means on the fire alarm circuit for automatically closing the electric starting motor circuit.

10. The combination with a fire alarm circuit and a vehicle having an internal combustion driving engine and an electric starting motor connected therewith, of a gear on the engine, a sliding gear on the electric starting motor, means for holding the sliding gear in mesh with the gear on the engine, means on the fire alarm circuit for automatically closing the electric starting motor circuit to start the engine turning, and means operated by the engine for automatically closing the ignition circuit.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

HENRY A. MENZEL.

Witnesses:
E. A. STANLEY,
A. J. CROWN.