F. A. WICKE & R. GARTENMEISTER.

IGNITING DEVICE FOR MINERS' SAFETY LAMPS.

APPLICATION FILED JULY 8, 1908.

908,432.

Patented Dec. 29, 1908

2 SHEETS—SHEET 1

Fig. 1

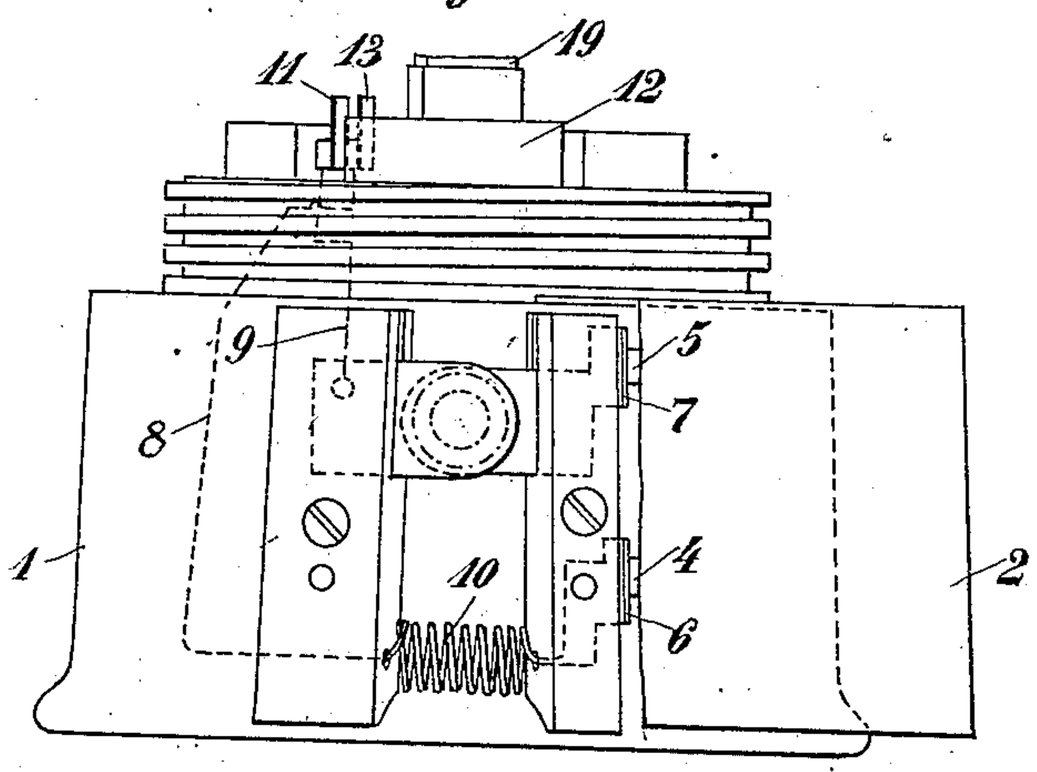
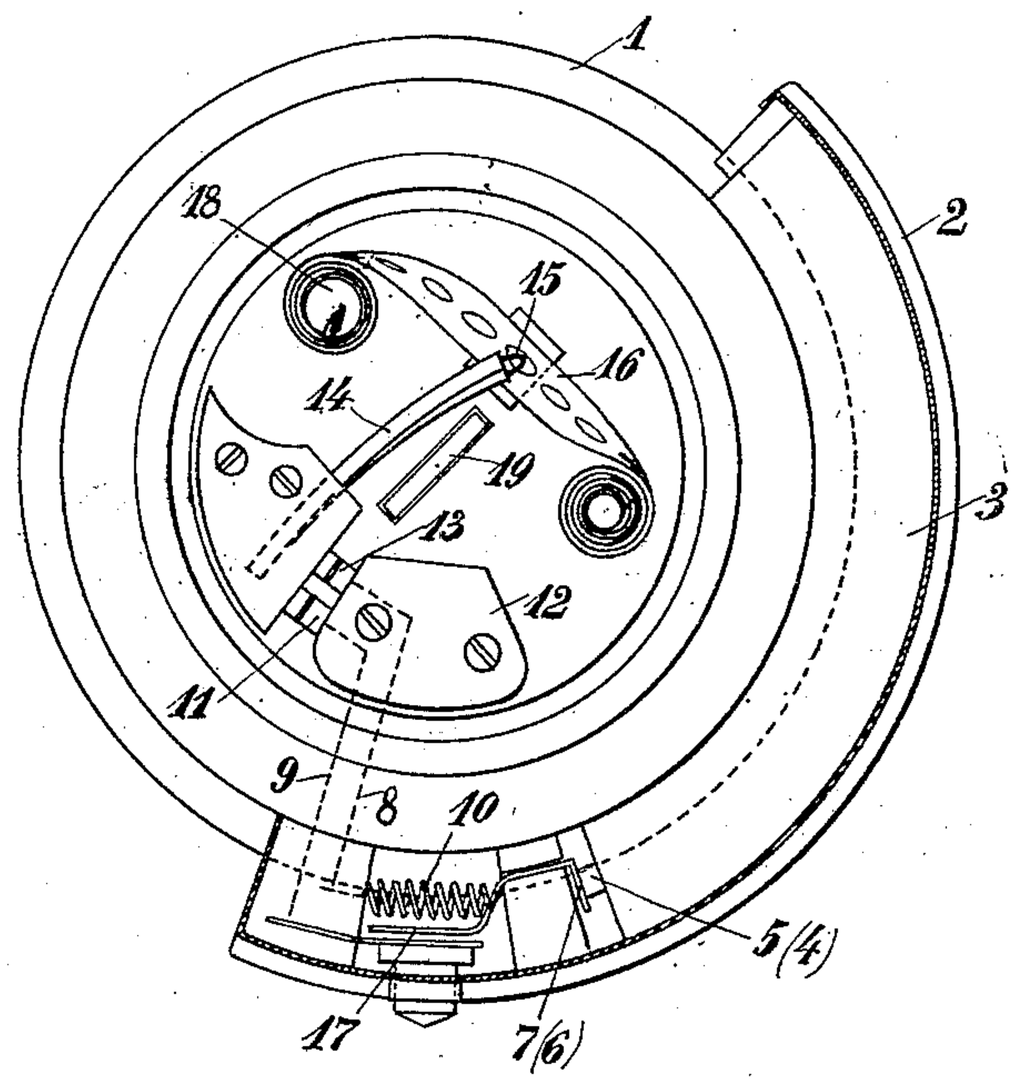


Fig. 2



Witnesses.

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Fig. 3

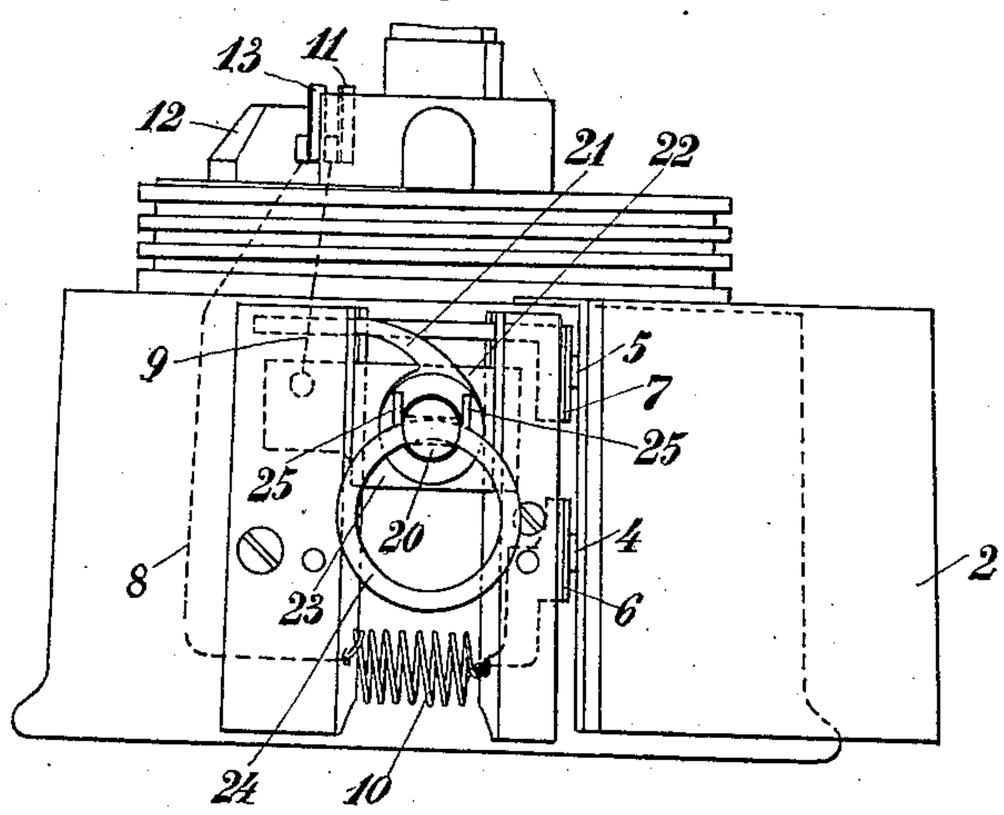


Fig. 5

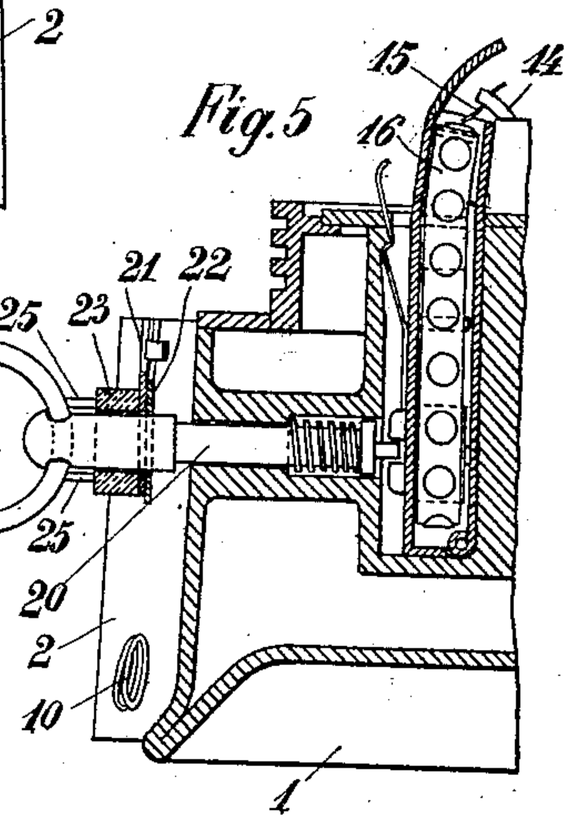
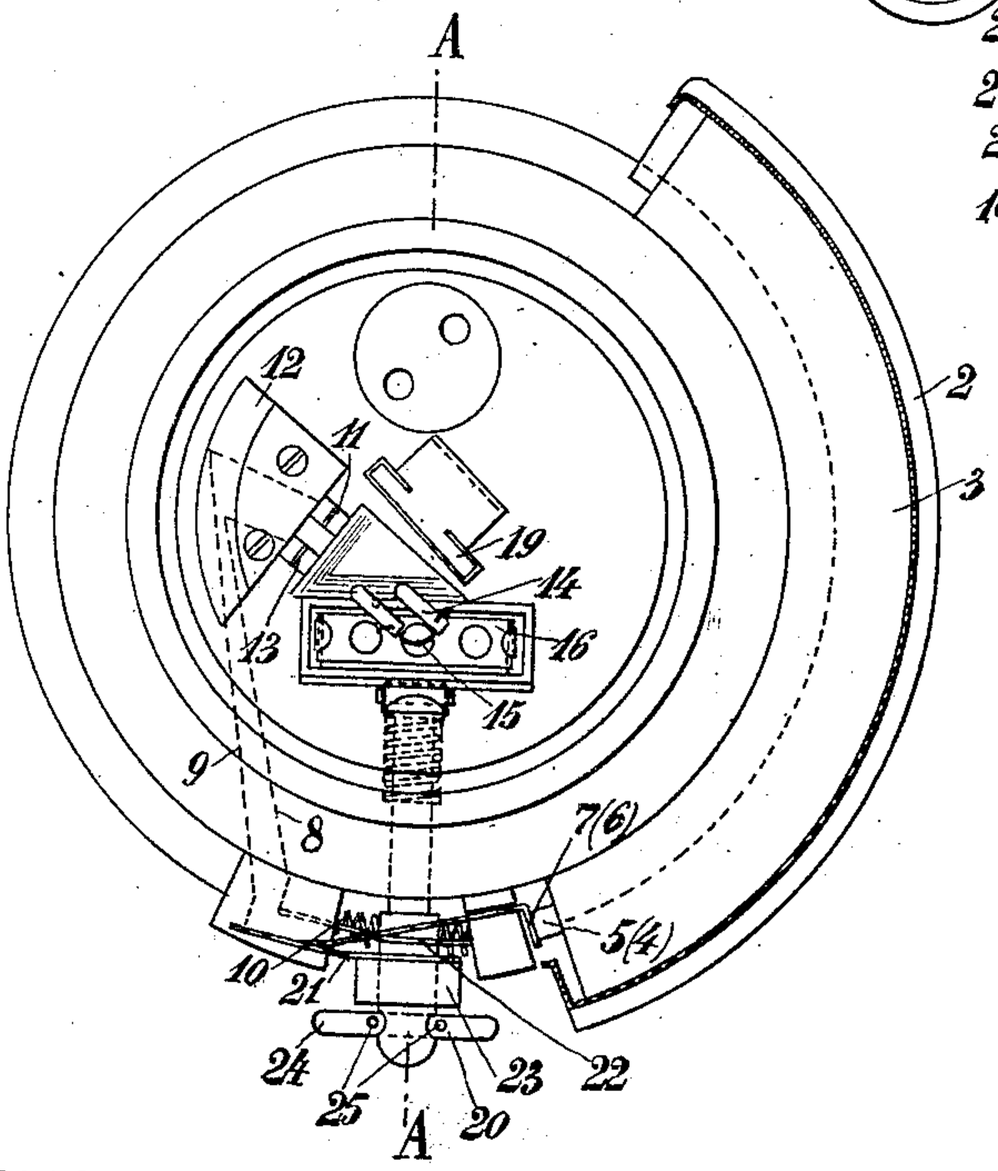


Fig. 4



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FERDINAND ARTHUR WICKE, OF BARMEN, AND RUDOLF GARTENMEISTER, OF ELBERFELD, GERMANY.

IGNITING DEVICE FOR MINERS' SAFETY-LAMPS.

No. 908,432. Specification of Letters Patent. Patented Dec. 29, 1908.

Application filed July 8, 1908. Serial No. 442,557.

To all whom it may concern:

Be it known that we, FERDINAND ARTHUR WICKE and RUDOLF GARTENMEISTER, citizens of the German Empire, residing at Barmen and Elberfeld, in the Province of Rhenish Prussia and Kingdom of Prussia, Germany, have invented certain new and useful Improvements in Igniting Devices for Miners' Safety-Lamps; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in devices for igniting miners' safety lamps and consists of the combination of primers and a platinum wire adapted to become incandescent and ignite the primer which in succession ignites the wick of said miner's safety lamp. In this case ignition takes place at a temperature far lower than that necessary in the case of the well-known forms as the explosion temperature of the priming composition is far lower than the ignition temperature of the gases rising in the lamp wick. The consequence is that the current requisite for heating the igniting wire up to (at most) red-heat may be considerably less than the currents employed in well-known electric igniting devices used in miners' lamps so that the saving in current is very considerable. It is in particular to be emphasized that the number of times that it is possible to ignite the lamps is not dependent on the life of the wire as this is unlimited, but solely and alone on the length of the priming band, or rather on the number of primers, so that said number of times may be increased at will by increasing the length of said band. The new arrangement can be applied in the simplest manner both in lamps of well-known construction and also in making new lamps.

The accompanying drawings illustrate by way of example, the bottom portion of two forms of lamps according to the invention.

Figure 1 shows in front elevation the first form of the bottom portion of a miner's safety lamp, part of the protective casing being omitted, while Fig. 2 shows said bottom portion in plan. Fig. 3 is a front elevation of the second form of the bottom portion of a safety lamp, said second form being distinguished from the first merely by the priming band being moved by turning a horizontal mandrel or spindle, whereas in the first form said band is moved by turning a vertical mandrel or spindle. Fig. 4 is a plan of the second form and Fig. 5 a section on part of the line A—A, Fig. 4.

A suitable source 3 of current, which may be for example a small accumulator fitting the curved form of the lamp base, is held on the bottom portion 1 of the lamp, which bottom portion is constructed in a well-known manner, by means of a sheet metal casing 2. The poles 4, 5 of the accumulator are connected with the contacts 6, 7 and the latter with the leads 8, 9. In the lead 8 there is connected a resistance in the form of a coil of wire 10 for regulating the current necessary for heating the igniting wire. The lead 9 runs directly to the contact 11 of the contact-piece 12, the other contact 13 of which is connected with the lead 8. From the contacts 11, 13 there runs the well insulated lead 14 to the igniting wire 15 which is a bright thin platinum wire situated directly in the neighborhood of the priming band 16.

If the circuit usually interrupted at 17 is closed, the igniting wire 15 begins to glow and by virtue of its heat, ignites the nearest primer on the priming band 16. By turning the vertical mandrel 18 another primer is brought under the platinum wire ready for the next igniting operation. The priming band 16 is led close past the lamp wick 19 as in well known constructions so that the gases leaving the wick are ignited on the explosion of a primer taking place.

The form shown in Figs. 3 to 5 is intended for miners' safety lamps in which the feed motion of the priming band is effected by a horizontal mandrel or spindle. The external form of the lamp is substantially the same as that of the first form and the electric, igniting device is the same if small differences in details be disregarded, which differences are due to the type of lamp being different. The usually interrupted circuit may be closed in the well-known manner by means of a press-button, but it is more advantageous so to connect the contact-device with the horizontal mandrel 20 for feeding forward the priming band 16 that the closure of the circuit is effected only during the feeding forward of the priming band. For this purpose the mandrel 20 passes through the contact springs 21, 22 which ordinarily do not touch one another and an insulating ring 23 is

pushed on the mandrel, which ring lies against the spring 21 and is pressed against the springs 21 and 22 when the handle ring 24 is raised by said ring or rather by small pins 25 projecting from it, so that springs 21 and 22 come into contact with one another and close the circuit. Each time that the priming band is to be fed forwards it is necessary to raise the handle-ring which usually hangs down, and as the circuit is directly closed by the handle-ring on being raised, ignition will occur immediately after a fresh primer has passed under the platinum wire. On account of the fact that when the handle-ring is let go the circuit is immediately broken again, it follows that the consumption of current is reduced to a very small amount and it is impossible for the circuit to be closed at the wrong time as is possible when an ordinary press-button being employed the latter is handled carelessly. All parts of the circuit are well insulated so that sparking, which might lead to the ignition of fire-damp, cannot take place.

Having now described our invention we declare that what we desire to secure by Letters Patent is:

1. In a miner's safety lamp the combination with the lamp wick of a priming composition in proximity thereto and a thin-platinum wire heated by an electric current and adapted to ignite said composition.

2. In a miner's safety lamp the combination with the lamp wick of a priming composition in proximity thereto, a fixed and permanently serviceable thin platinum wire heated by an electric current and adapted when heated to ignite said composition, a source of current and connections between the latter and said wire.

3. In a miner's safety lamp the combination with the lamp wick of a priming composition a priming band supporting said composition in proximity to said wick two spindles supporting said band a medium heated by an electric current and adapted when heated to ignite said composition, a source of current and connections between the latter and said medium.

4. In a miner's safety lamp the combination with the lamp wick of a priming composition a priming band supporting said composition in proximity to said wick two spindles supporting said band a fixed and permanently serviceable thin platinum ire heated by an electric current and adapted when heated to ignite said composition, a source of current and connections between the latter and said wire.

5. In a miner's safety lamp the combination with the lamp wick of a priming composition, a priming band supporting said composition in proximity to said wick, a horizontal spindle and another spindle supporting said band a medium over said band and heated by an electric current and adapted when heated to ignite said composition, a source of current and connections between the latter and said medium.

6. In a miner's safety lamp the combination with the lamp wick of a priming composition a priming band supporting said composition in proximity to said wick, a horizontal spindle and another spindle supporting said band, a thin platinum wire over said band and heated by an electric current and adapted when heated to ignite said composition, a source of current and connections between the latter and said wire.

7. In a miners' safety lamp the combination with the lamp wick of a priming composition, a priming band supporting said composition in proximity to said wick, a horizontal spindle and another spindle supporting said band, a fixed and permanently serviceable thin platinum wire over said band and heated by an electric current and adapted when heated to ignite said composition, a source of current and connections between the latter and said wire.

8. In a miner's safety lamp the combination with the lamp wick of a priming composition, a priming band supporting said composition in proximity to said wick, two spindles supporting said band, means for turning one of said spindles a medium heated by an electric current and adapted when heated to ignite said composition, a source of current, connections between the latter and said medium means for controlling said connections, and means interconnecting the means for turning one of the spindles and the means for controlling said connections.

9. In a miner's safety lamp the combination with the lamp wick of a priming composition, a priming band supporting said composition in proximity to said wick, a horizontal spindle and another spindle supporting said band, means for turning said horizontal spindle a platinum wire fixed directly over said band and heated by an electric current and adapted when heated to ignite said composition, a source of current, connections between the latter and said wire, means for controlling said connections, and means interconnecting the means for turning the horizontal spindle and the means for controlling said connections.

10. In a miner's safety lamp the combination with the lamp wick of a priming composition, a priming band supporting said composition in proximity to said wick, a horizontal spindle 20 and another spindle supporting said band, means for turning said horizontal spindle, a medium heated by an electric current and adapted when heated to ignite said composition, a source of current, connections between the latter and said medium, a member for controlling said connections and a handle-ring 24 revoluble on

the spindle 20 and normally hanging down therefrom, said handle-ring having pins 25 whereby when the handle-ring is raised for the purpose of turning the spindle said pins press against the member for controlling the connections.

11. In a miner's safety lamp the combination with the lamp wick of a priming composition, a priming band supporting said composition in proximity to said wick, a horizontal spindle 20 and another spindle supporting said band, means for turning said horizontal spindle, a medium heated by an electric current and adapted when heated to ignite said composition, a source of current, connections between the latter and said medium, a ring 23 for controlling said connections and slidingly mounted on said horizontal spindle and a handle-ring 24 revoluble on the spindle 20 and normally hanging down therefrom, said handle-ring having pins 25 whereby when the handle-ring is raised for the purpose of turning the spindle said pins press against the ring 23 for controlling the connections.

12. In a miner's safety lamp the combination with the lamp wick of a priming composition, a priming band supporting said composition in proximity to said wick, a horizontal spindle 20 and another spindle supporting said band, means for turning said horizontal spindle, a platinum wire fixed directly over said band and heated by an electric current and adapted when heated to ignite said composition, a source of current, connections between the latter and said wire, a ring 23 for controlling said connections and slidingly mounted on said horizontal spindle and a handle-ring 24 revoluble on the spindle 20 and normally hanging down therefrom, said handle-ring having pins 25 whereby when the handle-ring is raised for the purpose of turning the spindle said pins press against the ring 23 for controlling the connections.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses.

FERDINAND ARTHUR WICKE. [L. S.]
RUDOLF GARTENMEISTER. [L. S.]

Witnesses:
OTTO KÖNIG,
WM. WASHINGTON BRUNSWICK.