No. 866,289. PATENTED SEPT. 17, 1907.

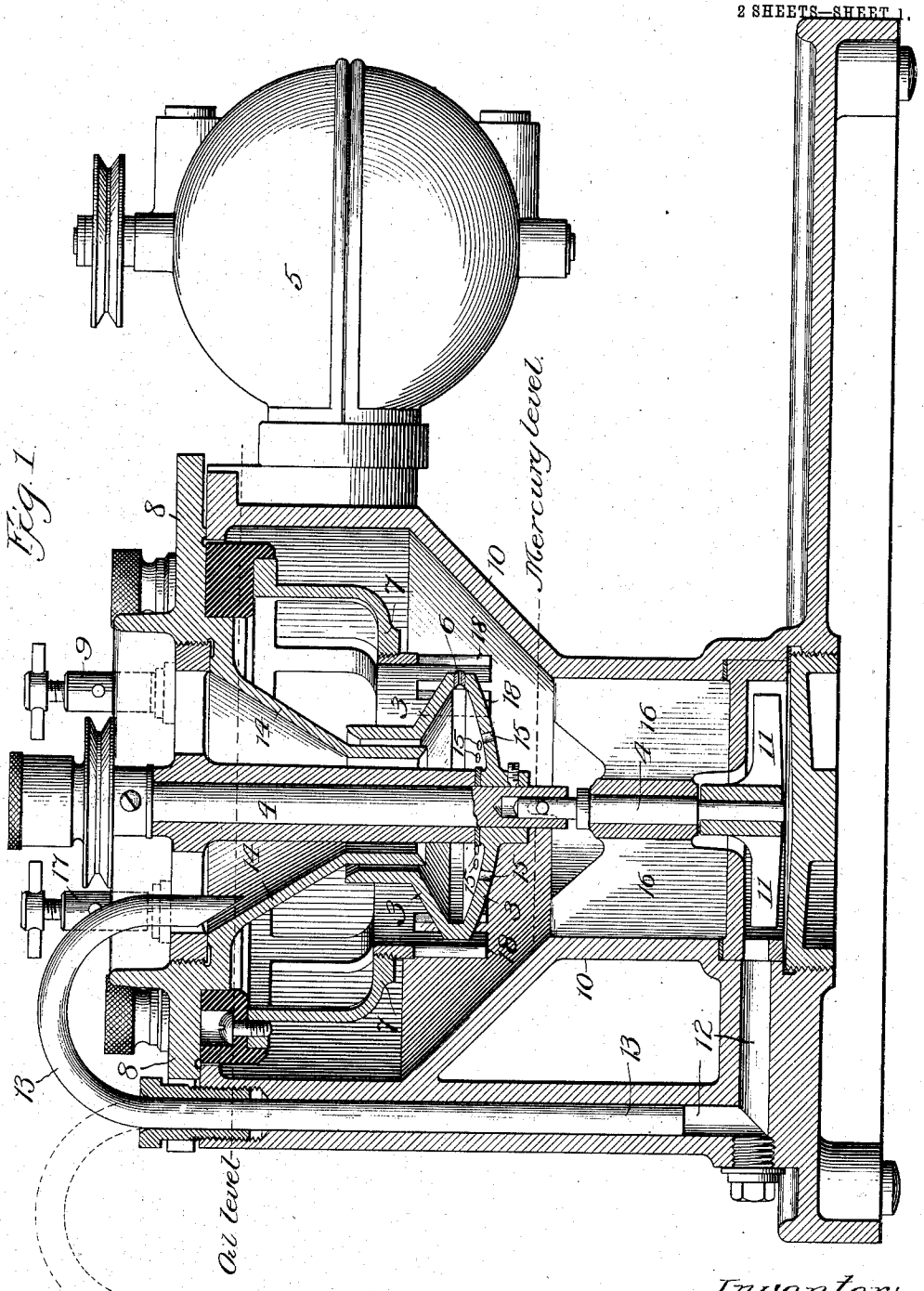
A. R. LUSCHKA.

MERCURY INTERRUPTER.

APPLICATION FILED DEC. 11, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



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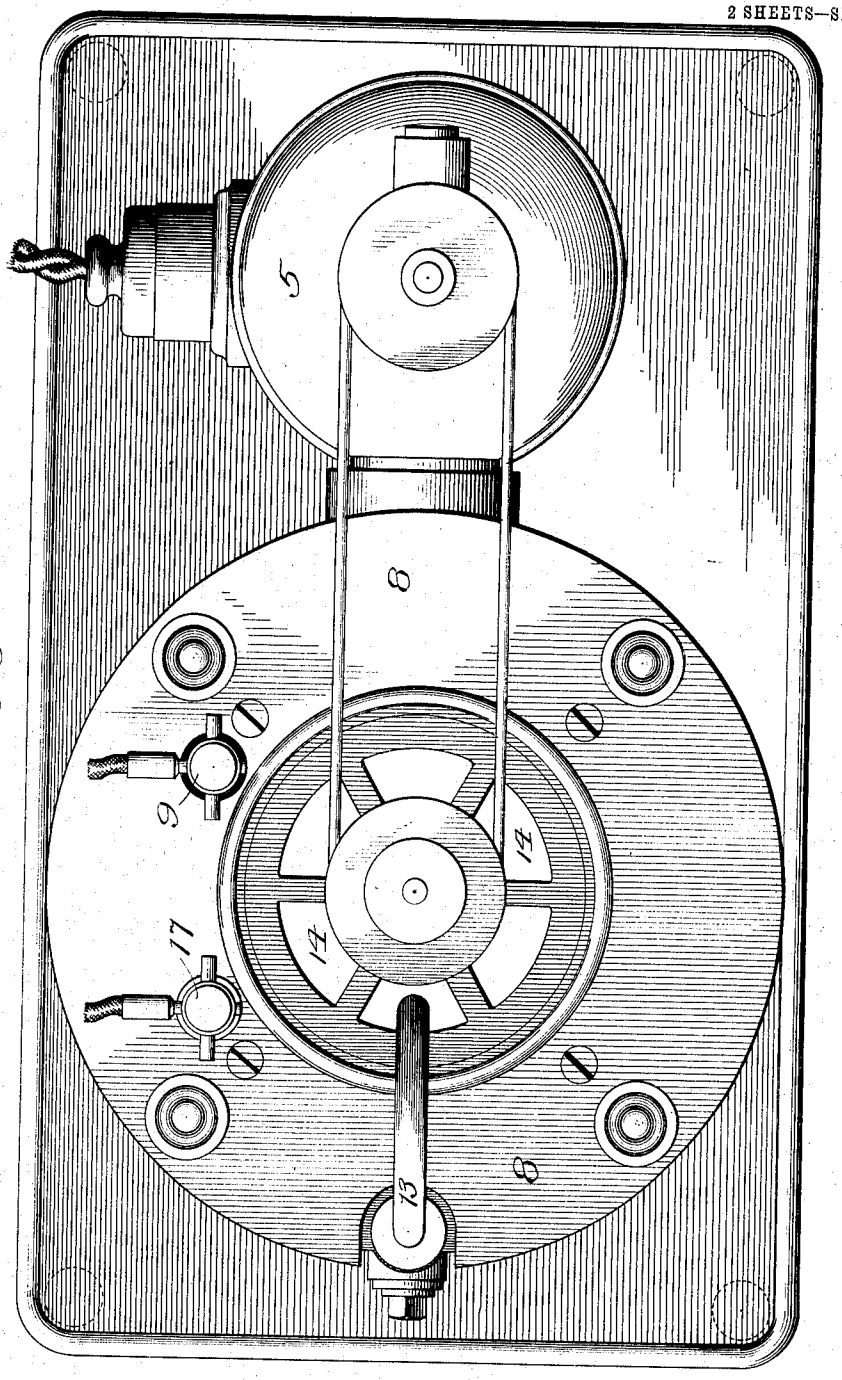
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MERCURY INTERRUPTER.

APPLICATION FILED DEC. 11, 1905.

2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

AUGUST R. LUSCHKA, OF RIVER FOREST, ILLINOIS, ASSIGNOR TO WESTERN ELECTRIC COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

MERCURY-INTERRUPTER.

No. 866,289. Specification of Letters Patent. Patented Sept. 17, 1907.

Application filed December 11, 1905. Serial No. 291,206.

To all whom it may concern:

Be it known that I, AUGUST R. LUSCHKA, a citizen of Switzerland, residing at River Forest, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Mercury-Interrupters, of which the following is a full, clear, concise, and exact description.

My invention relates to an electrical circuit interrupter of the fluid-jet type, and its object is to provide an improved device of this character which will be simple and efficient and easily cleaned.

In the use of mercury jet interrupters, it is found that the repeated sparking at the "break" tends to oxidize the mercury and also to decompose the oil in which the apparatus is normally immersed. The continued use of the apparatus also often produces a sort of emulsion of the mercury and oil, drops of mercury being held in suspension. Irregular action of the interrupter results, and the apparatus may become so fouled that the jet opening is choked up. In interrupters heretofore constructed the removal of the contents and cleaning of the apparatus is a disagreeable and difficult undertaking.

In the device of my invention the fluid contents of the vessel may be easily withdrawn and the parts cleaned without tipping or otherwise disturbing the position of the interrupter and without requiring handling of the fouled parts.

In the accompanying drawings, Figure 1 is a sectional elevation of my improved interrupter; and Fig. 2 is a plan view thereof, the same parts being designated by corresponding reference characters in both views.

The mercury container 3 is in the form of a cup or dish having the body portion of larger diameter than the mouth, and is mounted upon a shaft 4 which is adapted to be rotated by means of a motor 5 through the agency of suitable pulley and belt connections. A discharge opening 6 is provided in the periphery of said cup, from which opening the mercury issues in a jet under the pressure of the centrifugal force when the cup is rotated.

Stationary contacts 18 are provided at intervals around the side of the cup 3 to be struck by the mercury jet as the cup rotates. Said contacts 18 are shown as teeth extending downward from the ring 7 which is mounted upon but insulated from the under side of the cover 8. The binding post 9 which forms one terminal of the apparatus is in electrical connection with said ring.

The apparatus is inclosed in a vessel 10 which is adapted to contain oil or other insulating fluid, and also to receive the discharged mercury, which settles at the bottom of said vessel below the oil.

Vanes 16 should be provided in the vessel as usual to prevent churning of the contents.

In accordance with my invention, means are provided for withdrawing the mercury from the bottom of the inclosing vessel and conducting it either into the container to feed the jet, or into a separate receptacle. During the normal operation of the interrupter, the mercury will of course be conducted from the bottom of the inclosing vessel to the container, to be used again; but when it is desired to clean the apparatus, the entire contents of the vessel may be tapped off and a cleaning fluid, such as kerosene, passed through in the same manner.

In the apparatus shown in the drawing a centrifugal pump is arranged to be operated by the rotary shaft of the interrupter, the impeller wheel 11 of said pump being mounted at the lower end of said shaft, the inlet of said pump being located at the bottom of the inclosing vessel 10. The discharge duct 12 of the pump, through which the contents of the vessel may be thereby drawn off, is provided with a gooseneck discharge nozzle 13 which is slidably and rotatably mounted in said duct, so that said nozzle may occupy either the position shown in full lines, to return the mercury to the container through the funnel 14, or the position shown in dotted lines to discharge the entire contents of the vessel into a separate receptacle.

Another feature of my invention consists in the provision of separator openings 15, 15, in the floor of the rotary container, through which the lighter impurities may be discharged. The mercury is thus purified by a centrifugal separation before it is used in the jet.

In the operation of the device one terminal of the circuit to be interrupted is connected to the binding post 17 which is in electrical connection with the frame of the apparatus and so through the spindle or shaft with the mercury container and the mercury therein; while the other terminal of said circuit is connected to binding post 9 which is in electrical connection with the ring 7 having the contact teeth 18. The mercury vessel 10 being filled with oil and mercury about to the respective levels indicated, the shaft 4 is started in rotation by the motor 5. The centrifugal pump operated by said shaft 4 acts to withdraw mercury from the bottom of the vessel 10 and discharge the same through the duct 12 and nozzle 13 into the funnel 14 and so into the container or cup 3 which is also rotated by said shaft. From this cup the mercury is discharged in a jet through the opening 6, and as the cup rotates the circuit through the apparatus is completed while the jet is striking any of the teeth 18, and broken during the remaining intervals, very rapid interruptions being thus secured. The break takes place in the oil with which the inclosing vessel is filled above the level of the mercury. The mercury discharged from the jet sinks to the bottom of the receptacle, from which it is pumped out and used again and again, a continuous

circulation being kept up. As before stated, the lighter impurities which may be carried with the mercury into the rotary cup 3 are separated from the mercury by the centrifugal action of said cup, being discharged through the openings 15, 15, in the floor of the cup, while the purified mercury is carried to the periphery of said cup to be discharged through the jet opening 6.

When it is desired to clean the apparatus, the nozzle or discharge pipe 13 is turned to the position shown in dotted lines, whereby the entire contents of the vessel 10 may be withdrawn. A cleaning fluid such as kerosene may also be passed through the apparatus and removed in the same way, all without removing the cover or any of the parts, or handling the fouled portions.

I claim:

1. In a fluid jet interrupter, the combination with the jet and contact apparatus, of an inclosing vessel therefor adapted to contain the discharged conducting fluid and an insulating fluid, of means for withdrawing fluid from the bottom of said vessel and either supplying the same again to the jet or discharging said fluid elsewhere, substantially as and for the purposes set forth.

2. In a mercury jet interrupter, the combination with a rotary container having an opening in its periphery adapted to discharge the mercury in a jet therefrom, of a stationary contact adapted to be struck by said jet in its rotation, an inclosing vessel adapted to contain an insulating fluid and the discharged mercury, a centrifugal pump having an impeller wheel mounted to rotate with said rotary container, said pump having its inlet at the bottom of the inclosing vessel to withdraw the contents thereof, and a discharge pipe for said pump adapted to direct the discharge either into said rotary container to be used again or elsewhere to empty said vessel.

3. In an interrupter, the combination with a container having an opening adapted to discharge a jet of conducting fluid therefrom, of a contact plate in position to be struck by said jet, means for producing relative movement between said jet and said contact plate, an inclosing vessel adapted to contain the discharged conducting fluid, a duct communicating at the bottom with said vessel, means for producing a difference in pressure to cause the conducting fluid to be withdrawn from said vessel through said duct, and means for directing the discharge from said duct either into said container to be used again or elsewhere to empty and clean said vessel.

4. In a mercury jet interrupter, the combination with an inclosing vessel containing an insulating fluid and stationary contact pieces, of a rotary mercury cup in said vessel, said cup having a peripheral jet opening facing said contact pieces, and also having openings at a distance from the periphery through which the lighter impurities may be discharged:

5. The combination with a fluid jet circuit-interrupter, and means for supplying conducting fluid to the jet thereof, of a centrifugal separator arranged to feed said conducting fluid to said jet and to remove the lighter impurities therefrom before the same reach said jet, substantially as set forth.

6. In a fluid jet interrupter, the combination with a rotary shaft carrying a mercury cup having a peripheral discharge opening, of a stationary contact in position to be struck by the jet of mercury from said opening as the cup is rotated, an inclosing vessel for said parts, adapted to contain an insulating fluid and also to receive the discharged mercury, which settles at the bottom of said vessel, a centrifugal pump having its impeller wheel mounted on said shaft below the bottom of said vessel, said pump having its inlet from said vessel, and a discharge pipe for said pump adapted to conduct the mercury to the rotary cup to be used again.

In witness whereof, I hereunto subscribe my name this 25th day of September A. D., 1905.

AUGUST R. LUSCHKA.

Witnesses:
BERT STARR YORK,
ROY T. ALLOWAY.