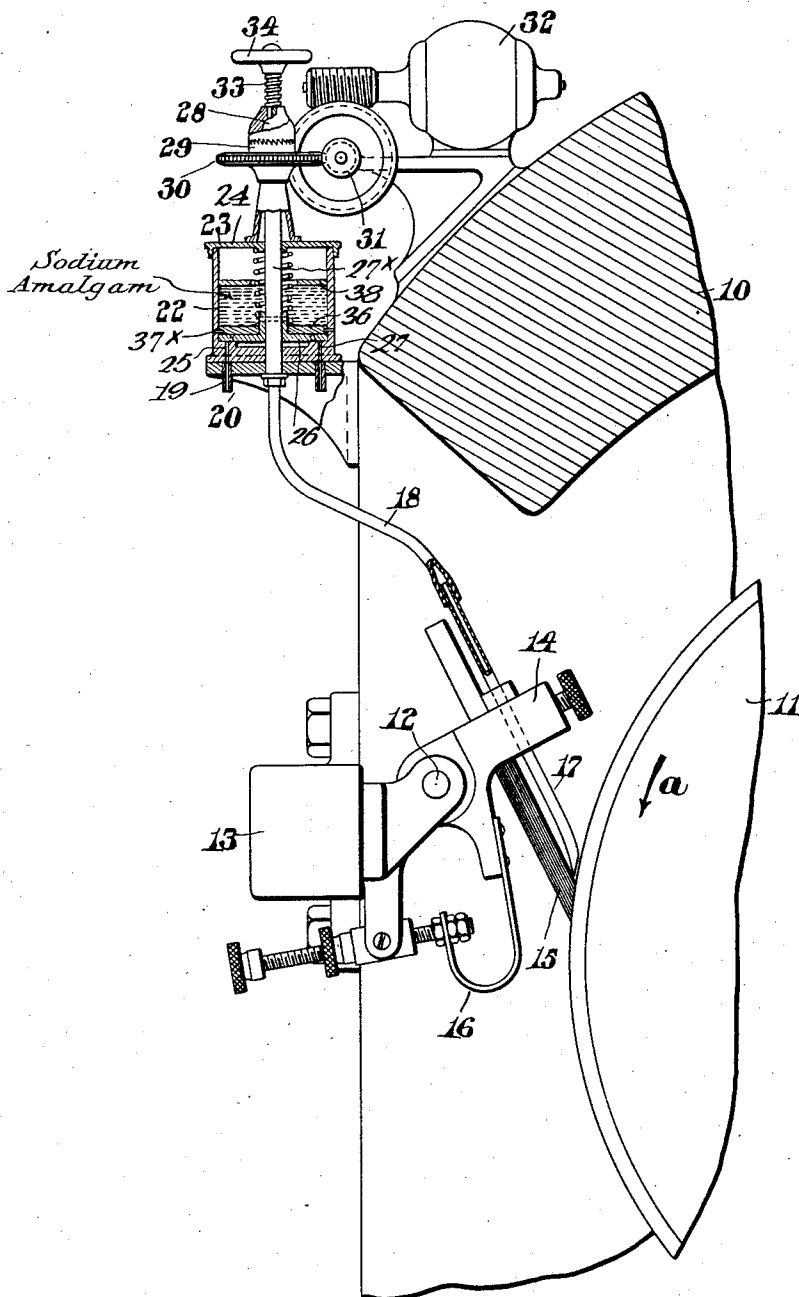


E. C. KETCHUM.
MERCURY DROPPER.
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1,059,304.

Patented Apr. 15, 1913.



Witnesses:
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UNITED STATES PATENT OFFICE.

ERNEST C. KETCHUM, OF BOSTON, MASSACHUSETTS.

MERCURY-DROPPER.

1,059,304.

Specification of Letters Patent.

Patented Apr. 15, 1913.

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To all whom it may concern:

Be it known that I, ERNEST C. KETCHUM, a citizen of the United States of America, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Mercury-Droppers, of which the following is a specification.

This invention relates to devices for lubricating the surface of an armature of a dynamo electrical machine driven direct at a high velocity from a high speed motor, the object of the invention being to not only lubricate the surface of the armature but also insure a proper electrical connection between the brushes and the surface of said armature as it rotates. Heretofore, in machines of this class, mercury has been applied to the surface of the armature at the point of contact therewith of the brushes, but objections have been found in practice to the supply of pure mercury to this surface, as it is liable in the rapid evolution of the armature, to be thrown therefrom by centrifugal action. To overcome this objection it has been found essential for the proper working of the dynamo electrical machine to supply intermittently from a suitable reservoir an amalgam which, when delivered upon the surface of the armature at a point adjacent to the contacting surface of the brushes, reduces the film of metallic oxid on the surface of the armature, and leaves said surface perfectly clean so that the mercury contained in the amalgam will adhere thereto and be prevented from being thrown therefrom during the rapid rotation of the armature.

The invention consists in certain novel features of construction and arrangement of parts which will be readily understood by reference to the description of the drawings and to the claims hereinafter given.

The drawing represents a portion of a dynamo electrical machine showing in section the reservoir for containing the amalgam, the driving operating mechanism therefor, and the connection of one of the tubes from such reservoir with a brush coacting with the armature of said machine.

Similar characters designate like parts throughout the several figures of the drawings.

In the drawing, 10 represents a portion of the frame of a dynamo electrical machine,

and 11 a portion of the armature thereon. Pivotaly secured at 12 to a bracket 13 mounted upon the frame 10 is a brush holder 14 carrying a brush 15, the ends of which coact with the surface of the armature 11 as indicated in the drawing. This brush is held in contact with the surface of said armature by means of a spring 16, the tension of which may be adjusted in any well-known manner. Extending through the brush holder 14 is a tube 17, one end of which is positioned adjacent to the surface of the armature 11 at the point of contact thereof with the end of the brush 15. This tube is connected by a flexible tube 18 to a delivery nozzle 19.

The nozzle 19 extends through a base plate 20 secured to the frame 10 of the dynamo electrical machine as indicated in the drawing. Through this base plate 20 extend as many nozzles 19 as there are brushes 15 each of which is provided with a delivery tube 17 connected by a flexible tube 18 with each of the nozzles 19. Secured to the base plate 20 by means of screws 21 is a reservoir 22 preferably made of nonmetallic material, and having threaded to its upper end a cover 23 provided with an air inlet 24. The bottom of said reservoir 22 is provided with a plurality of perforations 25, each of which register with a delivery nozzle 19. Immediately above the bottom of the reservoir 22 is a revoluble plate 26, preferably of non-metallic material, this plate being provided with a perforation 27 therethrough, which, during the revolution of said plate momentarily registers with each of the perforations 25 in said bottom plate. The plate 26 is secured to and rotates with a spindle or shaft 27* having splined thereto a toothed clutch member 28 coacting with a toothed clutch member 29 having formed thereon or secured thereto a worm gear 30 adapted to be driven by a worm 31, which in turn is driven through suitable connecting mechanisms by a motor 32. The clutch member 28 is held in contact with the clutch member 29 so that the teeth of the two members are normally in engagement by means of a spring 33 interposed between the end of said clutch member 28 and the handle 34 by which the shaft 27 and the plate 26 secured thereto may be rotated by hand when desired. Immediately above the revoluble plate 26 and held in contact therewith by

means of a spring 35 is a nonrevoluble plate 36 having therein a plurality of perforations 37 out of register with the perforations 25 in the bottom of the reservoir 22, two of these perforations being indicated in dotted lines in the drawing. This nonrevoluble plate is prevented from rotating with the revoluble plate 26 by means of the pin 37* extending through the wall of the reservoir 22 into peripheral grooves in said nonrevoluble plate 36. The reservoir 22 is filled with amalgam, this amalgam consisting of substantially 99½% of mercury and ½ of 1% of some alkali metal such as sodium or potassium, although other alkali metals may be used or alkaline earth metals may be used if necessary, but it has been found in practice that the amalgam formed of sodium and mercury in the proportion mentioned give the best results. Surrounding the spring 35 and floating upon the surface of the amalgam contained within the reservoir 22 is an annular disk 38 adapted to prevent the greater portion of the surface of said amalgam from exposure to the air.

While the nonrevoluble plate 36 is shown in the drawing as of nonmetallic material, this plate may be made of any material, as the pressure of the amalgam contained within the reservoir is sufficient to force the amalgam through the perforations 37 therein and keep them clear at all times. This pressure, however, does not act in the same manner upon the selected portions of the amalgam which pass from each of the perforations 37 into the perforation 27 of the revoluble plate 26, and as a consequence if the plate 26 was made of metal the walls thereof would soon become coated with the amalgam and be clogged so that the action of the device would be prevented. By making the tubes 17 and 18, the nozzle 19, the walls of the perforation 25, and the revoluble plate 26, all of nonmetallic material, the amalgam has no chemical action thereon and is permitted to pass freely to the surface of the armature 11 intermittently in selected quantities. By rotating the plate 26 by hand the amalgam can be delivered to the armature before starting the dynamo electrical machine and will immediately adhere to the surface thereof in such a manner

that it will not be thrown therefrom during its rapid rotation.

It is obvious that any of the tubes may be of metal and lined with nonmetallic material without altering the principles of this invention.

It is believed that the operation and many advantages of the invention will be thoroughly understood from the foregoing.

Having thus described my invention, I claim:

1. In a device of the class described, the combination of a revoluble member; a brush coacting therewith; and means for intermittently feeding to the periphery of said revoluble member an amalgam.

2. In a device of the class described, the combination of an armature; a brush coacting therewith; a receptacle adapted to contain an amalgam; a tube therefrom of nonmetallic material adapted to deliver a portion of the liquid to the periphery of said armature; and a nonmetallic revoluble plate within said receptacle provided with a perforation for separating a desired quantity of said amalgam from the remainder and delivering it to said tube.

3. In a device of the class described, the combination of a revoluble member; a brush coacting therewith; and means for intermittently feeding to the periphery of said revoluble member an amalgam containing an alkali metal.

4. In a device of the class described, the combination of a revoluble member; a brush coacting therewith; and means for intermittently feeding to the periphery of said revoluble member an amalgam containing one-half of one per cent. of an alkali metal.

5. In a device of the class described, the combination of a revoluble member; a brush coacting therewith; and means for intermittently feeding to the periphery of said revoluble member an amalgam containing sodium.

Signed by me at 4 P. O. Sq., Boston, Mass., this 4th day of March, 1912.

ERNEST C. KETCHUM.

Witnesses:

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