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COMMUTATOR WIPER AND OILER.

APPLICATION FILED NOV. 16, 1905.

Fig. 1

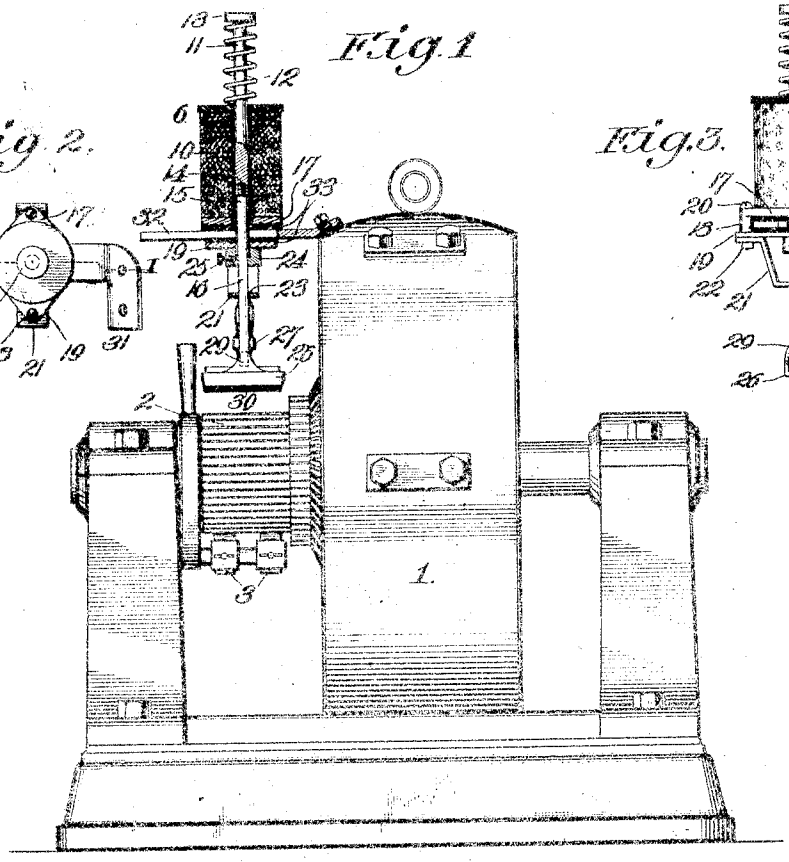


Fig. 2.

Fig. 3.

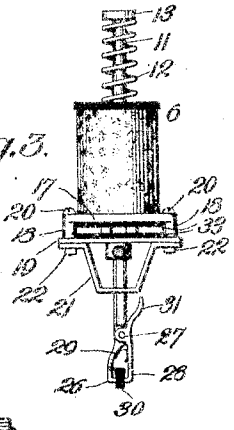


Fig. 5.

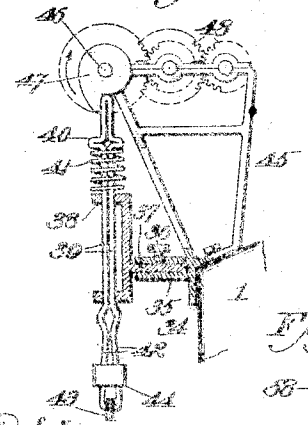


Fig. 6.

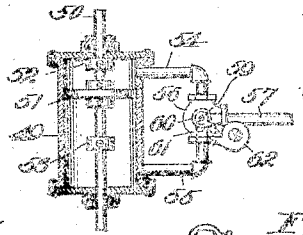


Fig. 4.

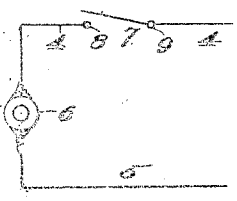


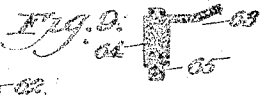
Fig. 7.



Fig. 8.



Fig. 9.



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UNITED STATES PATENT OFFICE.

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COMMUTATOR WIPER AND OILER.

No. 885,278. Specification of Letters Patent. Patented April 21, 1908

Application filed November 16, 1905. Serial No. 287,588.

To all whom it may concern:

Be it known that we, DANIEL D. NEVILLE, GEORGE H. CLAY, and JOHN H. CLEWER, citizens of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Commutator Wipers and Oilers, of which the following is a specification.

This invention relates to commutator wipers and oilers, and our object is to produce a device of this character which can be applied easily, quickly and economically to any dynamo, and which is applied to the commutator so lightly that it cleans the same and barely moistens it so that the film of oil shall not introduce resistance to the current generated nor cause the brushes to bounce from the commutator.

With this general object in view and others as hereinafter appear, the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed; and in order that it may be fully understood reference is to be had to the accompanying drawing, in which—

Figure 1 represents a side view of the dynamo equipped with a device embodying our invention; said device being shown in section on the dotted line I—I of Fig. 2. Fig. 2, is a top plan view of said device detached from the dynamo. Fig. 3, represents a detached view of said device as viewed at right angles to Fig. 1. Fig. 4, represents a diagrammatic view of a portion of the circuit in which said device is located; said circuit having a switch. Fig. 5, is a view partly in side elevation and partly in central vertical section of a modified form of said device. Fig. 6, is a similar view of a second modified form. Fig. 7 is a vertical section of a two-way valve forming a part of the construction shown in Fig. 6. Fig. 8, is a top plan view of part of the construction shown in Fig. 6. Fig. 9, is a vertical section of a third modified form of the device.

In the said drawings, 1 indicates a dynamo of any suitable or preferred type, 2 the commutator thereof, and 3 a pair of the brushes engaging said commutator.

4 and 5 indicate conductors of a circuit which may be a branch of the dynamo circuit, not shown, or may be an independent circuit.

6 indicates a solenoid electrically connected to conductors 4 and 5.

7 indicates a switch of any suitable type, adapted by engagement or disengagement with contact 8 to make or break said circuit and therefore energize or deënergize said solenoid, the switch being pivoted at point 9.

10 indicates the core passage of the solenoid, and 11 the plunger which fits and is adapted to move further into the solenoid when the latter is energized and to withdraw partially from the solenoid when the latter is deënergized, through the pressure of a spring 12 disposed between the upper end of the solenoid and the head 13 of the plunger.

Screwed into the lower end of the plunger as at 14 and depending therefrom is a rod 15 of brass or other substance which is not affected by the magnetic influence of the solenoid when energized, and the lower portion 16 of said rod is preferably flattened for a purpose which is hereinafter explained.

17 indicates the base of the solenoid and 18 sleeve portions depending therefrom toward a clamp plate 19, and extending through said sleeves and the clamp plate are bolts 20; said bolts also extending through a U-shaped guide bracket 21, underlying plate 19, where they are engaged by nuts 22. The guide bracket 21 is provided centrally with a passage 23 fitting snugly around the flattened portion 16 of rod 15 to prevent turning or swivel movement of the latter, and to limit reciprocatory movement of said rod it is equipped with a collar 24 secured by set screw 25, said collar being adapted to strike the clamp plate 19 in its upward movement and under certain conditions, bracket 21 in its downward movement. The lower end of the rod is bent and widened to form a clamping jaw 26, and pivoted at 27 to the rod is a companion angular jaw 28, said jaws being held pressed yieldingly together by a spring 29 or its equivalent, to cause them to reliably clamp and hold the interposed strip of wicking or other material 30, employed to wipe and oil the commutator, it being understood that it is preferred that the length of the strip of wicking shall equal the width of the commutator. When it is desired to re-

move the wicking for any purpose, the arm 31 of jaw 28 can be pressed toward the rod for the purpose of separating the jaws, as will be readily understood by reference to Fig. 3.

If convenient, in attaching the solenoid to the dynamo, we provide a bifurcated bracket 32, bolted to and insulated from the dynamo, the solenoid being slipped on said arm with the rod 15 engaging the bifurcation of the bracket. The device is also preferably insulated from the bracket by means of the insulating washers 33 clamped against opposite sides of said bracket by tightening the nuts 22. . By this arrangement it will be seen that the solenoid can be quickly adjusted toward or from the dynamo so as to dispose of it properly above the commutator, and then secured in the desired position by tightening said nuts.

In practice the solenoids for the dynamos will be connected up in series so that the operation of the switch will simultaneously energize or deënergize the solenoids. The energization of the solenoids attracts the plungers 11 and causes them to move toward the commutator until the combined wiper and oiler 30 lightly engages the commutator, this engagement being maintained as long as the switch is in engagement with contact 8, which by preference, will be but a small fractional part of a minute, the spring 12 reëlevating the plunger and the combined wiper and oiler the instant the circuit is broken. By this method the commutators of all the dynamos employed in a plant may be wiped and oiled with the desired frequency and at a minimum expense.

Fig. 5, illustrates a clock-work mechanism for automatically wiping and lubricating the commutator. In this construction a bracket 34 is secured to and insulated from the dynamo and is provided with a sleeve portion 35, equipped with a set screw 36 for clamping at the desired adjustment in said sleeve the arm 37 of a guide bracket 38. The plunger in this case is preferably made of flat metal bent to form the corresponding portions 39 extending slidingly through the bracket 38, and the head 40 above the bracket, a spring 41 corresponding to spring 12 being employed to normally hold the plunger elevated. The lower ends of arms 39 are bent to form the spring jaws 42, to clamp between them the combined wiper and lubricator 43 of the same type as the corresponding part 30, and to hold said jaws clamped upon said wicking we provide a sliding sleeve 44 which when shoved up permits the jaws to spring apart. 45 indicates an upwardly projecting portion of bracket 34 and journaled in the upper end of portion 45 is a shaft 46 provided with a cam 47, said shaft being driven at a predetermined speed through the action of a train of gearing 48, said gearing being driven in any suitable manner, so as to turn the cam in the direction indicated by the arrow. By this arrangement it will be seen that for the major portion of the revolution, the combined oiler and wiper will be out of contact with the commutator, and that it will be in engagement with the same only as the point of the cam rides over the upper end of the plunger, the spring 41 reëlevating the plunger immediately the point of the cam passes out of engagement with the plunger.

In Fig. 6, pneumatic means for operating the plunger is shown, and in said figure, 49 indicates an air cylinder, 50 the plunger forming the piston stem thereof, 51 the piston of said stem, and 52 a collar to limit upward movement of the piston. 53 indicates a similar collar to positively limit the downward movement of the piston, the last-named collar being adapted to prevent the combined oiler and wiper (not shown in Fig. 6) from being jammed heavily against the commutator. 54, 55 indicates branch pipes communicating with the cylinder above and below the piston and with a valve casing 56 connected to the air-supply pipe 57. A two-way valve 58 occupies said casing and is adapted to normally occupy the position shown in dotted lines Fig. 6, and full lines Fig. 7, for the purpose of normally holding the combined oiler and wiper out of engagement with the commutator. The stem 59 of said valve has an arm 60, and a spring 61 mounted on the stem and engaging the valve casing at one end and the arm at the other holds the valve normally in the position described. To reverse the position of said valve at intervals against the resistance of said spring so as to effect the application of the combined oiler and wiper to the commutator, the cam 62, like cam 47 of Fig. 5, may be employed to rock said arm 60 upward until pipe 57 and 54 are in communication so that the air will enter the cylinder above the piston and force the latter downward. As the point of the cam passes said arm the spring returns the latter and the valve to their original positions so as to instantly re-elevate the piston and therefore the combined oiler and wiper.

In Fig. 9, a combined oiler and wiper is shown which maintains a yielding pressure with the commutator at all times instead of periodically as in the figures previously described. In this construction, the bracket 63 secured to and insulated from the dynamo, is provided with a vertically depending sleeve portion 64 containing the combined oiler and wiper 65, which in this case will preferably be a stick of solidified lubricant. When said stick is used up it will be replaced with a new one.

From the above description it will be apparent that we have produced a commutator wiper and oiler embodying the features

of advantage enumerated as desirable and which obviously may be modified without departing from the principle of construction involved.

Having thus described the invention what we claim as new and desire to secure by Letters Patent, is:—

1. The combination with a dynamo, of a solenoid having a reciprocatory plunger comprising magnetic and non-magnetic portions united together at their ends and having such union point normally within the field of attraction of the solenoid; said portions projecting at their opposite ends beyond the corresponding ends of the solenoid wiping and oiling means carried by the non-magnetic portion of the plunger, engaging the commutator periodically, a head on the projecting magnetic portion of the plunger, and a spring interposed between said head and solenoid to hold said head yieldingly away from the solenoid.

2. The combination with a dynamo, of a solenoid arranged radially with respect to the commutator of the dynamo and adjustable in a direction substantially parallel with the axis of the commutator, a plunger partly within the solenoid and held yieldingly at one limit of its movement, a non-magnetic rod attached to the plunger within the solenoid and movable with the former, and an oiler and wiper proper detachably carried by said rod and adapted when the solenoid is energized and attracts said plunger to be pressed yieldingly against the commutator.

3. The combination with a dynamo, of a solenoid arranged radially with respect to the commutator of the dynamo and adjustable in a direction substantially parallel with the axis of the commutator, a plunger partly within the solenoid and held yieldingly at one limit of its movement, a non-magnetic rod attached to the plunger within the solenoid and movable with the former, and terminating at its opposite end in a jaw, a companion jaw pivoted thereto, a spring holding said jaws yieldingly together, and a substance for wiping and oiling the commutator clamped between and depending below said jaws.

4. The combination with a dynamo, of a bifurcated bracket secured to and insulated from the dynamo, a solenoid mounted and adjustable upon said bracket and provided with a magnetic plunger, a spring holding said plunger partly withdrawn from the solenoid, a non-magnetic rod extending through said bifurcated bracket and into the solenoid and attached to said plunger, a guide bracket for said rod carried by the first-named bracket, and a substance for oiling and wiping the commutator, detachably secured at the lower end of said rod.

5. The combination with a dynamo, of a bifurcated bracket secured to and insulated from the dynamo, a solenoid mounted and adjustable upon said bracket and provided with a magnetic plunger, a spring holding said plunger partly withdrawn from the solenoid, a non-magnetic rod extending through said bifurcated bracket and into the solenoid and attached to said plunger, a guide bracket for said rod carried by the first-named bracket, a substance for oiling and wiping the commutator, detachably secured at the lower end, of said rod, and means for positively limiting the movement of the plunger.

In testimony whereof we affix our signatures in the presence of two witnesses.

DANIEL D. NEVILLE.
GEORGE H. CLAY.
JOHN H. CLEWER.

Witnesses:
JOSEPH N. SAUNDERS,
SUSIE NEVILLE.