No. 647,016. Patented Apr. 10, 1900.

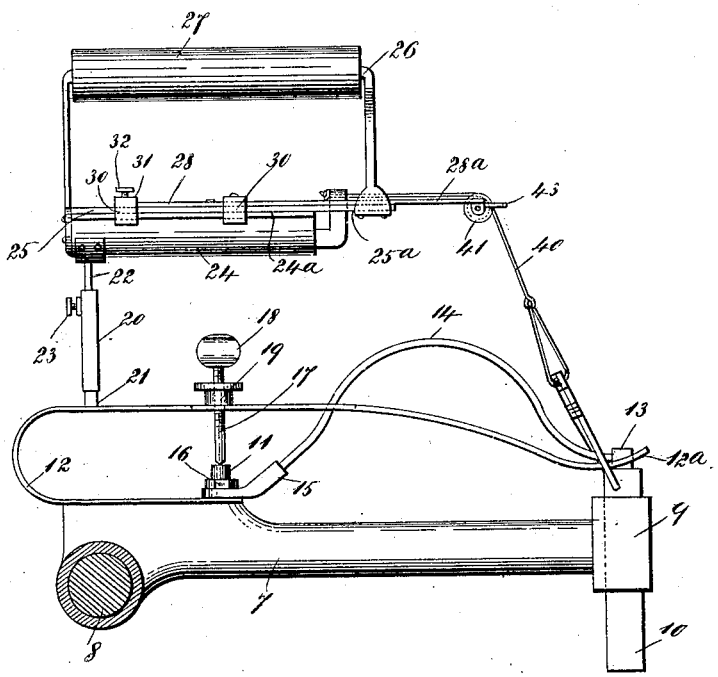
J. O. MOISSON.

PRESSURE REGULATOR FOR COMMUTATOR BRUSHES.

(Application filed Jan. 25, 1900.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.



WITNESSES

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FIG. 2.

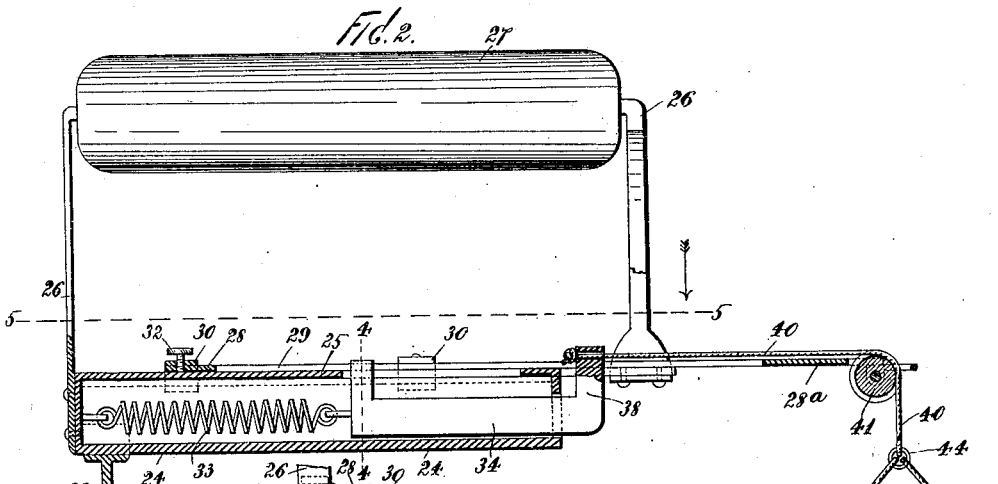


FIG. 3.

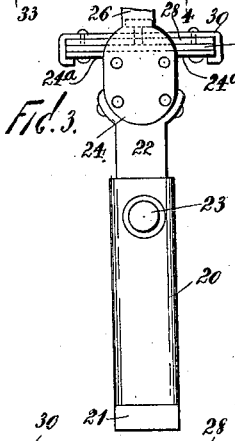


FIG. 4.

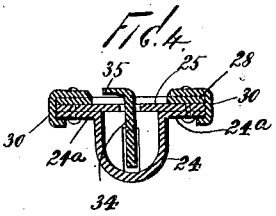
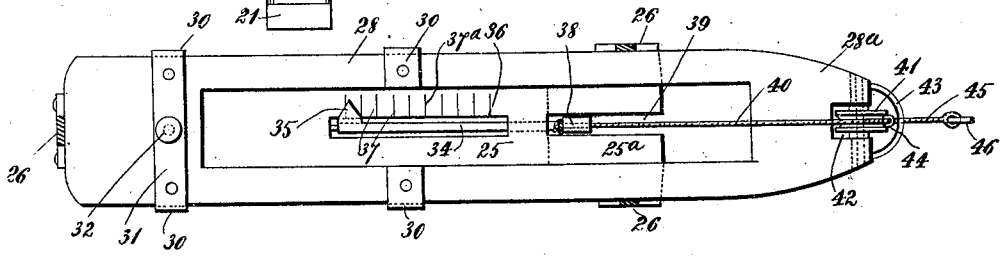


FIG. 5.



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UNITED STATES PATENT OFFICE.

JOEL OSCAR MOISSON, OF CHARLESTON, SOUTH CAROLINA.

PRESSURE-REGULATOR FOR COMMUTATOR-BRUSHES.

SPECIFICATION forming part of Letters Patent No. 647,016, dated April 10, 1900.

Application filed January 25, 1900. Serial No. 2,755. (No model.)

To all whom it may concern:

Be it known that I, JOEL OSCAR MOISSON, a citizen of the United States, residing at Charleston, in the county of Charleston and State of South Carolina, have invented certain new and useful Improvements in Pressure-Regulators for Commutator-Brushes, of which the following is a full and complete specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to pressure-regulators for commutator-brushes; and the object thereof is to provide a device of this class whereby an even pressure of all the brushes upon the bars of the commutator may be maintained and an uneven friction thereof and consequent roughening and wearing away of the operative surfaces of the commutator-bars prevented. By means of my improved brush-regulator sparking of the commutator-brushes is also to a great extent obviated.

My invention consists in the construction and arrangement of parts hereinafter described.

In the accompanying drawings, forming part of this specification, in which like reference characters denote corresponding parts in the several views, Figure 1 is a side elevation of a brush-holder and brush, showing my improved pressure-regulator operatively mounted in connection therewith. Fig. 2 is a sectional side elevation of the pressure-regulator shown in Fig. 1, part thereof being shown in full lines. Fig. 3 is a rear elevation of Fig. 2, partly cut away. Fig. 4 is a section of Fig. 2 on the line 4 4 thereof, and Fig. 5 is a plan view of Fig. 2 from a plane denoted by the line 5 5 therein and looking in the direction of the arrow connected with said line.

Commutator-brushes as at present mounted in operative position in the brush-holders are caused to bear tensionally upon the commutator-bars by means of spring elements which are connected with the brush-holders and which bear upon said commutator-bars, and the potential of these spring elements is determined by means of set-screws which bear upon the brush-holders and are turned down upon said spring elements. It is impossible to regulate the potential of all the spring elements so as to obtain an evenness of pressure of all of the spring elements upon their respective brushes, and the consequent unevenness of pressure causes an uneven wearing away of the operative ends of the brushes and of the commutator-bars upon which the brushes frictionally bear. To obviate the above disadvantages and to insure an equal pressure of all of the commutator-brushes upon the commutator, I have devised a pressure-regulator, which is shown in Fig. 1 mounted in operative position in connection with a brush-holder and brush.

In Fig. 1 the brush-holder is denoted by the general reference character 7 and is mounted upon a shaft or spindle 8, which is supported adjacent the commutator in any desired manner. The brush-holder 7 is provided at its outer end with a box or sleeve 9, in which the brush proper, 10, is slidably mounted in position to bear upon the commutator, and the brush-holder is provided adjacent its outer end with a stud 11, upon which is passed the inner end of a looped spring 12, the extreme end of which is engaged with the upper end of the brush 10, being bifurcated to straddle a binding-post 13, which is fixed to said brush.

A conductor 14 is connected at one end with the binding-post 13 and at the other end bears a tip or "pig-tail" 15, which is connected with the stud 11 by means of a lock-nut 16, and the current collected by the commutator-bars and passed through the brush 10 is led through the conductor 14 to the tip 15 and thus, in the ordinary manner, into the circuit-wires. A set-screw 17 is passed through the upper portion of the spring 12 and bears at its lower end upon the upper end of the stud 11. The set-screw 17 is provided with a thumb-piece 18 and with a lock-nut 19. By means of the set-screw 17 and the lock-nut 19 the outer end portion 12^a of the spring 12 may be depressed or raised to any predetermined extent to vary the tension of said spring upon the upper end of the brush 10 and correspondingly vary the pressure of said brush upon the commutator.

To regulate the pressure of the spring 12 upon the brush 10 without a tension-indicating device is extremely difficult, and for the purpose I provide a device, which is shown mounted upon the upper portion of the spring 12 by means of a tubular support 20, into the

lower end of which is fitted an insulating-tip 21, which bears directly upon the spring 12. The insulating-tip is made necessary by the fact that the spring 12 is within the circuit of the current proceeding from the brush 10 and through the brush-holder.

A bracket or standard 22 is slidably mounted in the tubular support 20, and its fixed position therein is adjustable by means of the set-screw 23. Fixed to the upper end of the standard 22 is a hollow body 24, the upper portion of which consists of a face-plate 25, which projects from the forward end thereof at 25^a, and connected with the rearward end of the body 24 and with said forward end 25^a of the face-plate 25 is a yoke-shaped support 26, provided with a handle 27, which is arranged in parallelism with the body 24.

Arranged upon the upper surface of the face-plate 25 is a supplemental plate 28, which, as clearly shown in Fig. 5, is provided with a longitudinal oblong opening 29, and the supplemental plate 28 projects a predetermined distance beyond the forward end portion 25^a of the face-plate 25 at 28^a. The supplemental plate 28 is provided at the side with curved guides 30, which pass beneath the lateral edges of the face-plate 25 and the flanged sides 24^a of the body 24, which flanged sides support the edge portions of the face-plate 25, as clearly shown in Fig. 1, and by means of the curved guides 30 the supplemental plate is prevented from lateral displacement upon the face-plate 25, and the longitudinal movement of said supplemental plate upon said face-plate is thereby allowed. The rearmost guides 30 upon either side of the supplemental plate 28 are connected by a cross-strip 31, through which and through the supplemental plate 28 passes a set-screw 32, by means of which the supplemental plate 28 may be fixed to the face-plate 25 in longitudinally-adjusted position.

In Fig. 2 is shown a coiled spring 33, one end of which is fixed to the rearmost end and within the body portion 24, and the forward end of which is connected with a pointer-bar 34, which is slidably mounted within said body portion and provided with an upwardly laterally directed pointer 35, which operates through a slot 36, formed longitudinally of the face-plate 25 and in connection with a scale 37, disposed upon the face of the face-plate 25, adjacent one edge of the slot 36. The forward end of the pointer-bar 34 is provided with an upwardly-directed end portion 38, which operates within a slot 39, formed in the forwardly-projected portion 25^a of the face-plate 25. Connected therewith is a cord or other flexible device 40, which passes operatively about a pulley 41, revolubly connected with the forwardly-extended portion 28^a of the supplemental plate 28 and arranged in alinement with a slot 42, cut in the end of said extension 28^a.

Connected with the extreme forward end portion of the extension 28^a is a segmental guide-wire 43, the ends of which are connected with said extension 28^a at either side of the slot 42. The cord 40 passes about the pulley 41 and between the same and the guide 43 and is provided at its lower end with a ring 44, with which are connected two cords 44 and 45, with each of which is connected one member 46 of a gripping device, (denoted by the general reference character 47,) and the gripping device 47 is constructed upon the principle of the ordinary lazy-tongs, the arrangement of parts being such that strain imposed upon the cords 45 will cause the pointed ends 48 of the members 46 to mutually approach and to grip an article placed therebetween.

The brush-pressure regulator is mounted upon the spring element 12 in the position shown in Fig. 1, the insulating-tip 21 engaging directly with said spring, and the pointed portions 48 of the members 46 of the gripping device 47 are engaged with either side of the brush 10, which is slidably mounted in the box 9 of the brush-holder.

Let it be presumed that the graduation 37^a of the scale 37 (shown in Fig. 5) corresponds to a value indicating the desired tension of the spring 12 upon the brush 10 and the consequent pressure of the said brush upon the commutator-bars. With the parts in the position shown in Fig. 1 the handle 27 is grasped by the operator and the forward end portion 28^a of the supplemental plate 28 is elevated, the entire regulator device being pivoted upon the insulated tip 21 until the gripper device 47 has raised the brush 10 from the commutator-bars. When the brush has been thus raised from the commutator-bars, the set-screw 17 is adjusted to cause the end portion 12^a of the spring 12 to bear upon the brush 10 to such an extent that when the brush 10 has been brought into engagement with the commutator-bars the pointer 35 will be in registration with the graduation 37^a, and it is therefore determined that a tensional pressure of, say, two and one-half pounds is exerted upon the brush 10. If this operation be repeated in connection with all of the brushes of the brush-holder or brush-holders, an even pressure of all the brushes upon the commutator-bars is obtained, and an even frictional wearing of the brushes and commutator-bars consequently ensues.

I do not limit myself to the specific construction and arrangement of parts herein specified, but reserve the right to vary the same within the scope of my invention.

Having fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The herein-described means for regulating the pressure of commutator-brushes provided with tensional means for holding the same in engagement with the commutator, comprising a tension-scale having a pointer element, and means connected with said pointer element which are engaged with the

commutator-brush, said tensional element of the commutator-brush being provided with means for regulating the tension thereof, substantially as shown and described.

2. The herein-described means for regulating the pressure of commutator-brushes, which commutator-brushes are mounted in brush-holders carrying tensional elements which operate in connection with said brushes, and which tensional elements are provided with means for regulating the potential thereof; comprising a scale device provided with a tensional pointer element, and devices connected with said pointer element which are engaged with the commutator-brush, said scale device being provided with an insulated support which operates in connection with the brush-holder, substantially as shown and described.

3. The herein-described pressure-regulator for a commutator-brush, which commutator-brush is slidably mounted in a brush-holder and which brush-holder is provided with a tensional element which operates in connection with said brush and is provided with means for regulating the potential thereof; comprising a body portion provided with a support which operates in connection with the brush-holder, said body portion being provided with a scale and with a tensional pointer device which operates in connection with said scale, said pointer device being provided with devices which are engaged directly with said brush, substantially as shown and described.

4. The herein-described pressure-regulator for commutator-brushes, comprising a body portion provided with an insulated support and with a handle, said body portion being further provided with a scale and with a tensional pointer device which operates in connection with said scale, and gripper devices which are flexibly connected with said pointer device and which are directly engaged with said brush, substantially as shown and described.

5. A pressure-regulator for commutator-brushes, comprising a body portion provided with an adjustable insulating-support and with a scale, a spring-retracted pointer device provided with a pointer which operates in connection with said scale, a supplemental member which is adjustably connected with said body portion and provided at one end with a pulley, and a cord or other flexible device connected with said pointer device and passed operatively about said pulley, said cord being provided at its outer end with a gripper device which is directly engaged with said brush, substantially as shown and described.

6. A pressure-regulator for commutator-brushes, comprising a body portion provided at one end with an adjustable support carrying at its lower end an insulating-tip, said body portion being provided with a slotted face-plate having a scale, a pointer-bar mounted within said body portion and arranged to slide therein, and tensionally connected with the rear end of said body portion by means of a spring, said pointer-bar being provided with a pointer which operates in connection with said scale, and a supplemental plate slidably and adjustably connected with said face-plate and superposed thereon, said supplemental plate being provided at its outer end with a slotted portion in alinement with which is arranged a pulley, a flexible device which is connected with said pointer-bar and passed about said pulley and provided at its outer end with two pivoted gripper members, the free ends of which are directly connected with the brush, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 16th day of January, 1900.

JOEL OSCAR MOISSON.

Witnesses:
G. H. HOPKINS, Jr.,
WALTON S. ADAIR.