R. W. BORCHARD.

BRUSH HOLDER.

APPLICATION FILED JULY 31, 1911.

1,192,268. Patented July 25, 1916.

Fig. 2

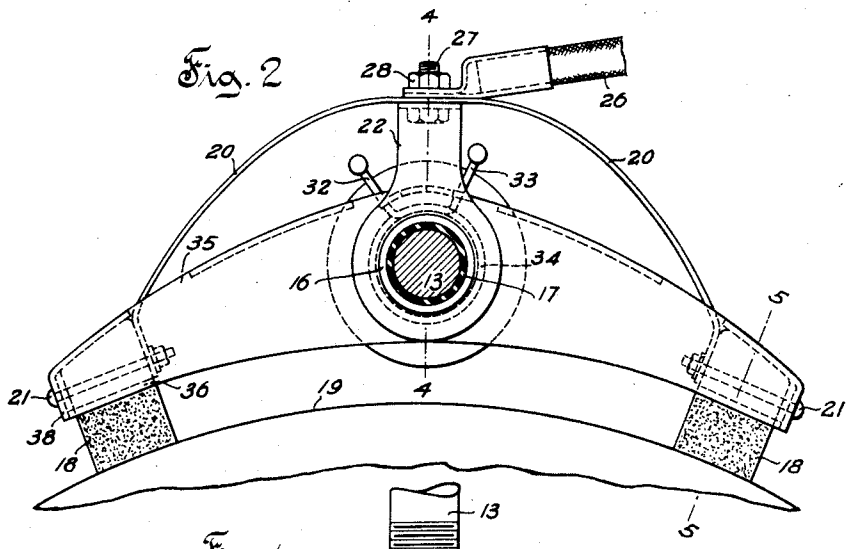


Fig. 1

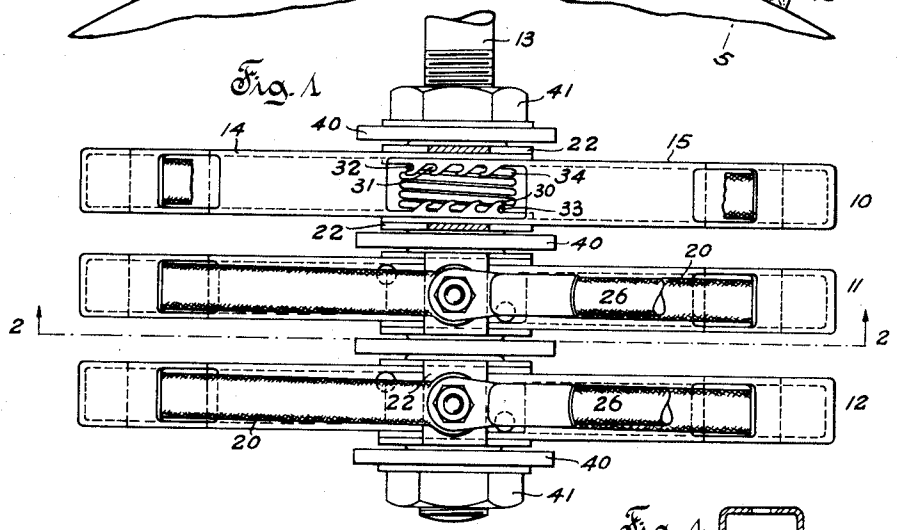


Fig. 4

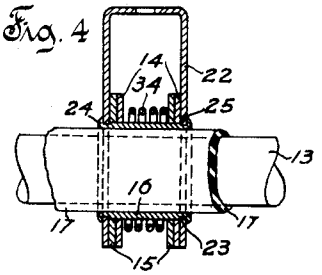


Fig. 3

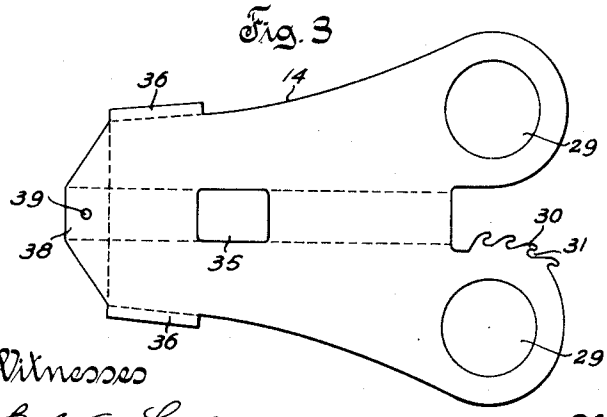
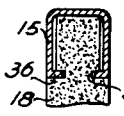


Fig. 5



Witnesses

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UNITED STATES PATENT OFFICE.

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BRUSH-HOLDER.

1,192,268. Specification of Letters Patent. Patented July 25, 1916.

Application filed July 31, 1911. Serial No. 641,532.

To all whom it may concern:

Be it known that I, ROBERT W. BORCHARD, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Brush-Holders, of which the following is a full, clear, and exact specification.

This invention relates to brush holders.

One of the objects of the invention is to provide a simple and inexpensive brush holder which is adapted to meet all of the requirements of successful commercial operation.

Another object is to provide a brush holder the construction of which obviates the transmission of any twisting stresses from the brush holder proper to the brush holder studs.

The various novel features of my invention will be apparent from the specification and drawing and will be particularly set forth in the appended claims.

The invention is illustrated on the accompanying sheet of drawings in which—

Figure 1 is a top elevation of a set of my brush holders mounted on a stud; Fig. 2 is a side elevation, partly in section, the section being taken along the line 2—2 of Fig. 1 and looking in the direction indicated by the arrows; Fig. 3 is a development of the main body portion of one of my brush holders; Fig. 4 is a sectional view taken along the line 4—4 of Fig. 2; and, Fig. 5 is a detail sectional view taken along the line 5—5 of Fig. 2.

Attention is first directed to Fig. 1 of the drawings showing three sets 10, 11, and 12 of my brush holders mounted on a stud 13. Each set of said brush holders includes two oppositely disposed pressure arms 14 and 15 which are loosely mounted on a sleeve 16. The sleeve 16 in turn is mounted over some insulation 17 which is interposed between the stud 13 and sleeve 16. The sleeve is preferably mounted loosely over the insulation 17, and the pressure arms being at all times free to rotate on the sleeve 16. Each of the pressure arms 14 and 15 is provided with a brush 18 adapted to bear on a collector surface 19. Pig-tails 20 are secured to the brushes 18 by bolts 21 passing through the brushes and pressure arm. The pig-tails 20 leading from the brushes 18 of each set of brush holders are secured to a supporting member 22 which is mounted upon reduced portions 23 of the sleeve 16. After the pig-tail supporting member is mounted on the reduced portion of the sleeve 16, the end portions 24 of said sleeves are spun over forcing the pig-tail support into firm engagement with the shoulders 25 formed by the reduced portions of the sleeve 16. These pig-tails are secured to a conductor 26 and to the support 22 by a bolt 27 and nut 28.

The pressure arms 14 and 15, which are preferably stamped out of sheet metal, are duplicates and are interchangeable. The pressure arms may also be made of cast metal. A development of one of the pressure arms is shown in Fig. 3. The stamped piece or punching is provided with two round holes 29 adapted to receive the sleeve 16 before the pig-tail support 22 is mounted on said sleeve. This punching is also provided with a plurality of projections 30 forming notches 31 to receive the ends 32 and 33 of a spring 34 mounted over the sleeve 16 between the pressure arms and adapted to bias said oppositely disposed pressure arms in opposite direction toward the collector rings. The pressure arm punching is further provided with an opening 35 through which the pig-tail 20 passes. The arms are punched to provide projections 36 which are adapted to occupy grooves 37 in the brushes 18 to prevent rocking of said brushes. Another projection 38 of the punching is provided with a hole 39 through which the bolt 21 passes to support one of the brushes 18 securely in one of the spring-pressed pressure arms. A small space is left between the brushes 18 and the bent over projections 38 of the punchings to allow for any degree of tightening of the brushes in the followers.

Between adjacent sets of brush holders and at the sides of the extreme sets, insulating collars 40 are mounted over the stud 13. After the sets of brushes and collars 40 are mounted on the studs, nuts 41 are drawn up to retain in position the sets of brushes as units. No matter how tightly the nuts 41 are drawn up, the pressure arms 14 and 15 will be free to rotate on the sleeves 16 for the reason that the portions of the pig-tail supports mounted on the sleeve 16 are held in firm engagement against the shoulders 25 of the sleeve 16 and cannot be forced against the pressure arms 14 and 15 to pinch them.

The springs 34 are, therefore, at all times effective in forcing the oppositely disposed pressure arms with their brushes toward the collector rings. The tension of the springs may be varied by changing the positions of the ends 32 and 33 of each spring to the various notches 31 formed in the pressure arms.

By means of this arrangement any desired pressure, within practical limits, between the brushes and the collecting surface may be obtained. These interfitting pressure arms 14 and 15 may be arranged in various ways with respect to the single spring.

There may be other modifications and arrangements which have not been here specifically shown and described, and it is my intention to cover all such modifications and arrangements which do not depart from the spirit and scope of my invention as set forth in the appended claims.

What I claim as new is:

1. In combination, a stud, oppositely disposed pressure arms mounted on said stud, brushes carried by said arms, and a single spring mounted over said stud and acting on both of said pressure arms.

2. In combination, a stud, oppositely disposed interchangeable pressure arms mounted on said stud, brushes carried by said arms, and a single spring mounted over said stud and acting on both of said pressure arms.

3. In combination, a stud, oppositely disposed interfitting pressure arms having notches mounted on said stud, brushes carried by said arms, and a spring the ends of which engage said notches for biasing said pressure arms in opposite directions.

4. In combination, a stud, oppositely disposed interfitting pressure arms mounted on said stud and having notches and openings, brushes carried by said pressure arms, a support mounted over said stud, pig-tails from said brushes passing through said openings and connected to said support, and a spring engaging said notches and biasing said pressure arms in different directions.

5. In combination, a stud, a sleeve mounted on and insulated from said stud, oppositely disposed pressure arms loosely mounted on said sleeve, brushes carried by said pressure arms, and a spring mounted over said sleeve and engaging said arms and biasing said arms in different directions.

6. In combination, a sleeve, oppositely disposed interfitting pressure arms mounted on said sleeve, a support also mounted on said sleeve, brushes carried by said arms, pig-tails from said brushes and secured to said support, and a spring engaging and biasing said arms in opposite directions.

7. A one-piece sheet metal brush holder, comprising side portions and a part connecting said side portions, the brush holder being provided at one end with integral means whereby it may be supported in operative position, that portion of the connecting part at the opposite end of the brush holder being bent over to form with the side portions a brush-receiving recess closed on three sides, one of the side portions at the brush-receiving recess being provided with a projection for engagement in a recess in a brush to prevent displacement thereof.

8. In combination, a supporting member, a plurality of arms mounted on said supporting member, a brush mounted on each arm, and a single resilient member carried by the supporting member and in operative engagement with both arms.

9. In a brush-holder, a supporting member, oppositely disposed, similarly formed arms mounted on said supporting member, brushes carried by said arms, and a spring mounted on said supporting member and operatively engaging said arms.

10. In combination, a sleeve, a support mounted on said sleeve and secured in fixed position relative to said sleeve, oppositely disposed arms movably mounted on said sleeve, brushes carried by said arms, connections from said brushes held in position on said support, and a spring engaging and biasing both of said arms to operative position.

11. In combination, a stud, a support mounted on said stud and secured in fixed position relative thereto, oppositely disposed arms mounted on said stud and free to move thereon, brushes carried by said arms, connections from said brushes to a conductor terminal on said support, and a single spring for biasing said arms to operative position, the body portion of said spring being disposed about said stud and an end of said spring engaging each of said arms for biasing the latter to operative position.

12. In combination, a supporting stud, a plurality of oppositely disposed arms mounted on said stud, a brush mounted on each arm, a support mounted on said stud and fixed in position thereon, conductor securing means on said support, and a conductor and connections from said brushes secured in electrical engagement by said conductor securing means.

Milwaukee, Wis., July 27, 1911.

In testimony whereof I affix my signature, in the presence of two witnesses.

ROBERT W. BORCHARD.

Witnesses:

CHAS. L. BYRON,

CLARA E. BENSEL.