

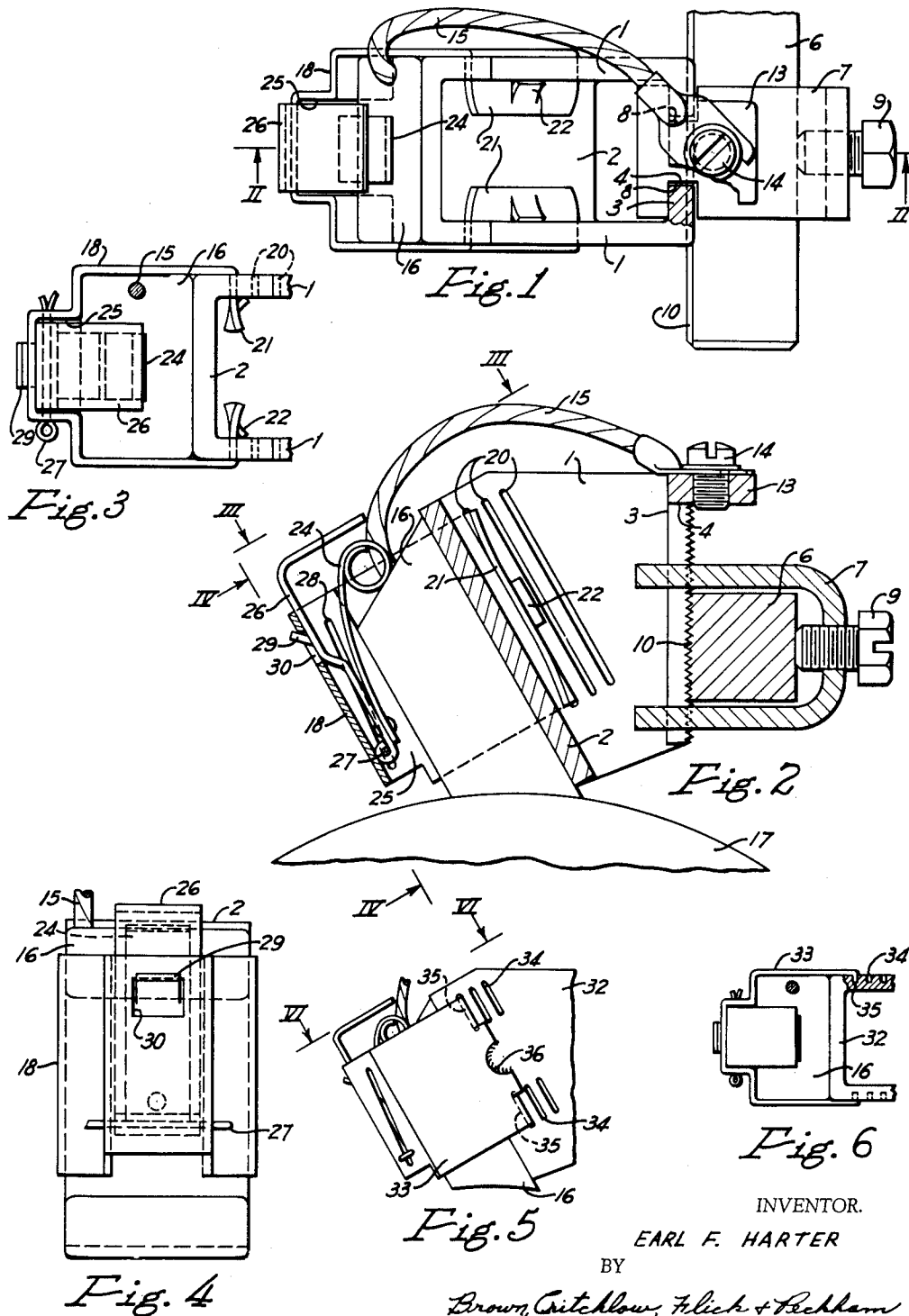
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ELECTRIC BRUSH HOLDER

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ELECTRIC BRUSH HOLDER

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This invention relates to holders for electric brushes used with rotating electrical machines, and more particularly to holders adjustable in size and position.

In some cases it is quite desirable to make electric brush holders from die castings, but in the past this has been expensive because of the tooling costs required for holders of different sizes to accommodate different size brushes. Also, brush holders generally require the drilling or milling of their supports, which not only adds to the cost but also interferes with full adjustment of the holders.

It is among the objects of this invention to provide an electric brush holder which is adjustable for receiving brushes of several different thicknesses, which is of relatively simple construction, which has a substantial portion die cast, which does not require special operations on its support, and which is adjustable easily both axially and radially of the rotating member that the brush engages.

In accordance with this invention, a bracket, preferably a die casting, is formed for attachment to a support adjacent a rotating circular member of an electrical machine. The bracket has spaced side walls connected by an end wall. The outside of the end wall is adapted to be engaged by one side of an electric brush, one end of which engages the rotating member. Extending around the remaining sides of the brush is a guard, which has a generally U-shape form with its sides overlapping the side walls of the bracket. The overlapping areas are provided with interengaging detents for connecting them together, with the end wall of the bracket located different distances from the opposite side of the guard. Consequently, brushes of different thicknesses can be disposed in the holder. A spring is mounted in the guard in a position to press against the outer end of the brush to press its opposite end against the rotating member. The bracket preferably has another end wall provided with a slot open at one end. The ends of a U-shape clamp extend through the slot and then project laterally to engage the inside of the end wall. The clamp will extend around an ordinary stud, to which it can be fastened by a set screw that extends through the clamp. By loosening the screw, the clamp can be moved lengthwise of the stud, and the bracket can be moved crosswise of the stud.

The invention is illustrated in the accompanying drawings, in which

Fig. 1 is a plan view of my brush holder;

Fig. 2 is a vertical section taken on the line II-II of Fig. 1;

Fig. 3 is a fragmentary plan view taken on the line III-III of Fig. 2;

Fig. 4 is an end view taken on the line IV-IV of Fig. 2;

Fig. 5 is a fragmentary side view of a modification, and

Fig. 6 is a plan view taken on the line VI-VI of Fig. 5.

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Referring to the first four figures of the drawings, a hollow die-cast metal bracket has parallel side walls 1 connected at one end by an inclined end wall 2. The end wall 3 at the opposite end of the bracket is vertical when the bracket is in the position shown, and is provided throughout the major portion of its height with a central slot 4 that is open at the bottom of the bracket. In order to fasten the bracket to an ordinary stud 6 projecting horizontally from a stationary part (not shown) of the rotating electrical machine with which this brush holder is used, a U-shape clamp 7 extends around three sides of the stud and has its end portions extended through the bracket slot. The ends of the clamp inside the bracket project laterally in opposite directions and engage the inside of the slotted end wall. If the portion of the clamp outside of the bracket is about the same width as the part inside, the clamp will be provided with notches 8 that receive portions of the end wall at opposite sides of its slot. The outer end of the clamp contains a set screw 9 that is tightened against the adjacent side of the stud to cause the clamp to pull the bracket tightly against the opposite side of the stud and thereby hold it firmly in place. By loosening the screw, the clamp and bracket can be slid lengthwise along the stud. Also, when the screw is loose, the bracket can be raised or lowered relative to the clamp and stud. To help hold the bracket at any desired level, especially before the clamp has been tightened, the outside of the bracket and the adjoining side of the stud may be provided with interengaging horizontal serrations 10.

Projecting laterally over the clamp from end wall 3 of the bracket, is an integral lug 13 that may be provided with a tapped hole 14 for receiving a screw that will attach an electrical brush shunt 15 to the bracket.

Engaging the outside of the inclined end wall of the bracket is an electric brush 16, the lower end of which engages a commutator or collector ring 17 (Fig. 2) of an electrical machine. To hold the brush in place, an adjustable guard 18 is used, which is cast or made of sheet metal and is of general U-shape. It will have some resiliency, so that if its side walls are pulled apart to some extent, they will spring back to their original positions when released. The guard extends around three sides of the brush and engages two opposite sides of it. The sides of the guard also overlap the side walls of the bracket for a short distance. The overlapping areas of the two members are provided with interengaging detents so that the guard can be connected to the bracket with the inclined end wall 2 of the bracket located different distances from the opposite inclined side of the guard. The distance selected will depend on the thickness of the brush that is to be used in the holder.

The interengaging detents just mentioned preferably consist of projections and openings. Thus, each side wall of the bracket is provided with laterally spaced openings through it, which most suitably are slots 20 parallel to the inclined wall of the bracket. The side walls of the guard are provided with intumed members that will project into any desired pair of the slots to connect the guard to the bracket. The easiest way to form the intumed members is to merely bend the free ends 21 of the guard side walls toward each other. They can be sprung apart far enough to permit them to slide along the sides of the bracket until they can snap into the slots. The slots are so located that the guard will receive brushes of different standard thicknesses. For example, when the guard is connected to the outer slots, it may receive a brush $\frac{3}{8}$ of an inch thick. If the guard projects into the next slots, it will receive a brush only $\frac{1}{2}$ inch thick. The guard will take only a $\frac{3}{8}$ inch thick brush if its ends project through the inner slots. To further secure the guard on the bracket, the ends of the guard that project

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through the bracket slots may be provided with outstruck tongues 22 that will spring out and engage the inner surfaces of the bracket side walls. Once a brush holder has been adjusted for a certain size brush, it is not likely that the adjustment will ever be changed, but with the arrangement shown, there is a choice of three adjustments with the same bracket and guard. Of course, more or less slots may be provided, if desired.

The brush is pressed against the rotating member 17 by a spring 24 mounted in the guard. It is preferred to use a leaf spring that tends to curl up and that has a curled end engaging the outer end of the brush. From this point the spring extends down along the outer side of the brush in a recess 25 formed by off-setting the central portion of the outer side of the guard. The lower end of the spring is secured to an elongated plate 26, which has its lower end mounted on a cotter pin 27 extending through slots 28 in the side walls of the recess. These slots extend upwardly. By lifting on the bent upper end of the plate, the pin can be pulled up to the upper ends of the slots in order to lift the spring away from the brush so that a new brush can be inserted in the holder. The spring normally is held in its lower operative position by locking the plate in its lower position. This can be done by striking a lug 29 out of the side of the plate and inserting it in an opening 30 in the adjoining side of the guard. When it is desired to release the spring, the plate is pushed down far enough to permit the lug to be swung out of the guard opening and then the plate is raised with the spring.

In the embodiment of the invention shown in Figs. 5 and 6, the only difference from that just described is that instead of using long slots that extend entirely through the side walls of the bracket 32 to hold the guard 33 in place, the outside of each side wall is provided with slots 34 that extend only part-way through. If desired, the slots can be divided into upper and lower groups, in which case only the upper and lower corner portions 35 of the guard are turned in for projection into the slots. The portion of the guard between the upper and lower slots may be brazed to the sides of the bracket at 36 after the desired adjustment has been made. This will prevent any accidental dislodging of the guard from the bracket.

According to the provisions of the patent statutes, I have explained the principle of my invention and have illustrated and described what I now consider to represent its best embodiment. However, I desire to have it understood that, within the scope of the appended claims, the invention may be practiced otherwise than as specifically illustrated and described.

I claim:

1. An electric brush holder comprising a bracket adapted to be fastened to a support adjacent a rotating circular member and having an end wall and side walls, the outside of the end wall being adapted to be engaged by one side of an electric brush extending toward the rotating member, and a resilient guard of general U-shape adapted to extend around the remaining sides of the brush and overlapping said bracket side walls, said side walls and guard being provided with interengaging detents for connecting them together with the end wall of the bracket different distances from the opposite side of the guard.

2. An electric brush holder comprising a bracket adapted to be fastened to a support adjacent a rotating circular member and having an end wall and side walls, the outside of the end wall being adapted to be engaged by one side of an electric brush extending toward the rotating member, each side wall of the bracket being provided with laterally spaced openings, and a resilient guard of general U-shape adapted to extend around the remaining sides of the brush and overlapping said bracket side walls, said guard being provided with intumed mem-

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bers projecting into a pair of said openings to connect the guard to the bracket.

3. An electric brush holder comprising a hollow bracket adapted to be fastened to a support adjacent a rotating circular member and having an end wall and side walls, the outside of the end wall being adapted to be engaged by one side of an electric brush extending toward the rotating member, each side wall of the bracket being provided with laterally spaced slots parallel to said end wall, and a resilient guard of general U-shape adapted to extend around the remaining sides of the brush and overlapping said bracket side walls, the ends of the guard extending through a selected pair of said slots to connect the guard to the bracket, said guard ends inside the bracket having outstruck tongues engaging the inner surfaces of said bracket walls to lock the guard on the bracket.

4. An electric brush holder comprising a bracket adapted to be fastened to a support adjacent a rotating circular member and having an end wall and side walls, the outside of the end wall being adapted to be engaged by one side of an electric brush extending toward the rotating member, a resilient guard of general U-shape adapted to extend around the remaining sides of the brush and overlapping said bracket side walls, said side walls and guard being provided with interengaging detents for connecting them together with the end wall of the bracket different distances from the opposite side of the guard, opposite sides of the guard being provided with slots extending lengthwise of the bracket end wall, a pin extending through the slots and slidable lengthwise thereof, a mounting plate having one end mounted on the pin inside the guard, a leaf spring fastened to said end of the plate and having a free end adapted to press against one end of a brush to press its opposite end against said rotating member, and means for detachably connecting said plate to the guard.

5. A brush holder according to claim 4, in which said opposite side of the guard is provided with an opening, and said mounting plate is provided with a lug normally projecting into said opening to hold said pin near one end of said slots, the plate being rotatable on the axis of the pin to withdraw said lug from said opening to permit the pin to be pulled toward the opposite end of the slots.

6. An electric brush holder comprising a hollow bracket having parallel side walls connecting end walls, a separate U-shape clamp adapted to extend around a mounting stud adjacent a rotating circular member, the ends of the clamp and one end wall of the bracket being detachably hooked together, a set screw extending through the clamp opposite to the bracket and adapted to bear against said stud to pull the bracket tightly against the stud, the outside of the opposite end wall of the bracket being adapted to be engaged by one side of an electric brush extending toward the rotating member, and a resilient guard of general U-shape adapted to extend around the remaining sides of the brush and overlapping said bracket side walls, said side walls and guard being provided with interengaging detents for connecting them together with the end wall of the bracket different distances from the opposite side of the guard.

7. A brush holder according to claim 6, in which said one end wall of the bracket is provided with a slot open at one end, and the ends of said clamp extend through that slot and have laterally projecting portions engaging the inside of said one end wall of the bracket at the opposite sides of the slot.

8. In an electric brush holder, a hollow bracket having parallel side walls connecting end walls, one end wall being provided with a slot open at one end, a separate U-shape clamp adapted to extend around a mounting stud adjacent a rotating circular member, the ends of the clamp extending through said slot and having laterally projecting portions engaging the inside of said slotted end

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wall of the bracket at the opposite sides of the slot, a set screw extending through the clamp opposite to the bracket and adapted to bear against said stud to pull the bracket tightly against the stud, the outside of the opposite end wall of the bracket being adapted to be engaged by one side of an electric brush extending toward the rotating member, and a guard of general U-shape adapted to extend around the remaining sides of the brush and overlapping said bracket side walls, said side walls and guard being provided with means connecting them together.

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References Cited in the file of this patent

UNITED STATES PATENTS

1,444,363	Baylis	Feb. 6, 1923
1,859,470	Road	May 24, 1932
2,495,184	Samzelius	Jan. 17, 1950
2,862,123	Arsenault	Nov. 25, 1958

FOREIGN PATENTS

1,105,020	France	May 22, 1954
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