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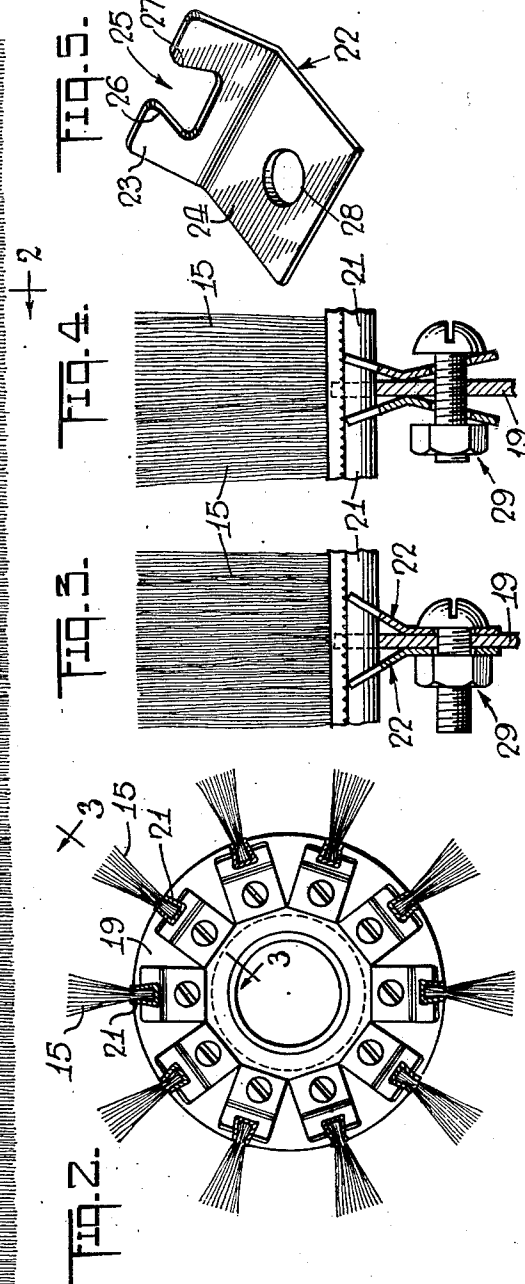
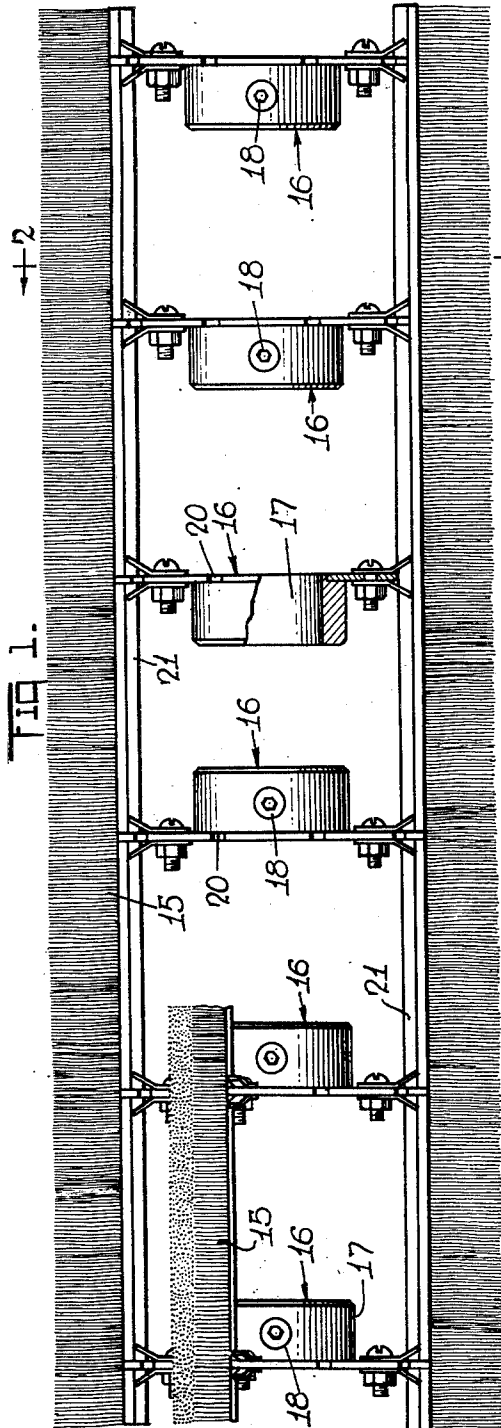
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2,651,798

BRUSH COMPRISING BRUSH STRIPS AND HOLDER THEREFOR

Filed May 28, 1947

2 Sheets-Sheet 1



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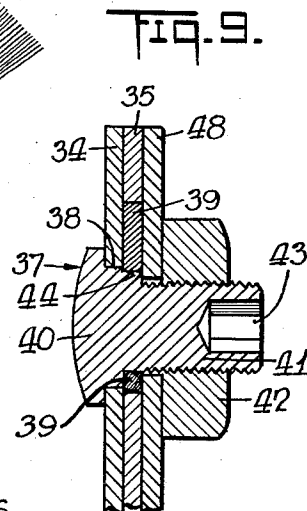
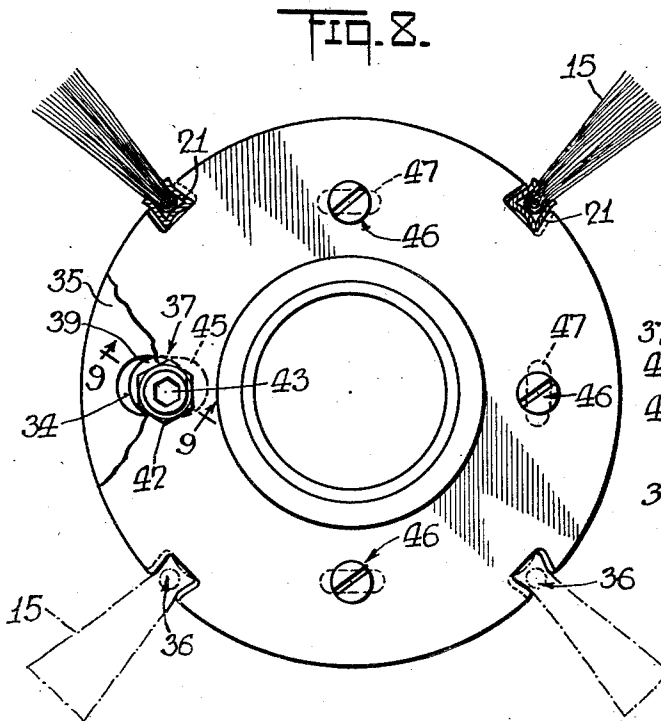
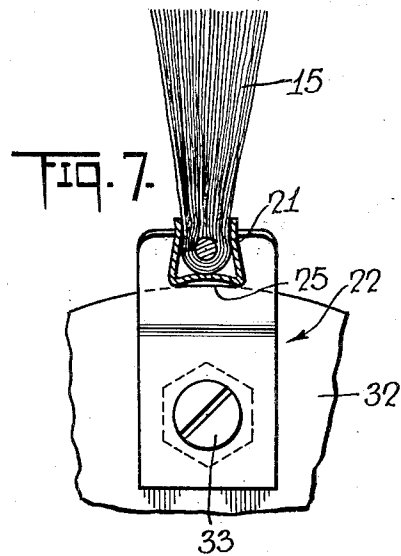
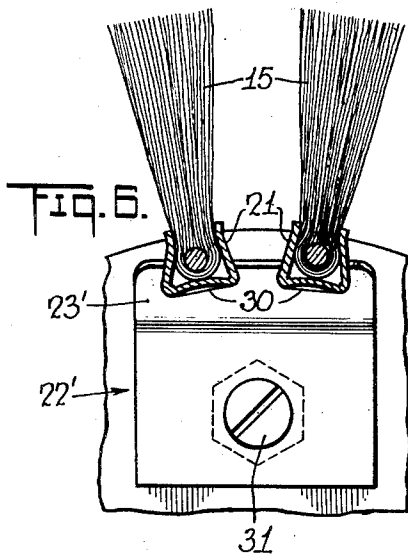
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BRUSH COMPRISING BRUSH STRIPS AND HOLDER THEREFOR

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2 Sheets-Sheet 2



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BRUSH COMPRISING BRUSH STRIPS AND
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8 Claims. (Cl. 15—183)

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My invention relates to brushes, and in particular to supporting means for brushes composed of one or more strip-type brush elements.

It is an object of my invention to provide an improved device of the character indicated.

It is another object to provide an improved, adjustable, supporting and clamping means for more readily assembling a brush of the character indicated.

It is a general object to provide a simpler and less costly brush-supporting structure having features which inherently make for low-cost assembly in combination with brush elements, and for low-cost maintenance of assembled brushes.

Other objects and various further features of the invention will be pointed out or will occur to those skilled in the art from a reading of the following specification in conjunction with the accompanying drawings. In said drawings:

Fig. 1 is a partially broken-away side view of a partially assembled brush incorporating features of the invention;

Fig. 2 is a sectional view taken in the plane 2—2 of Fig. 1;

Fig. 3 is an enlarged sectional view taken in the plane 3—3 of Fig. 2;

Fig. 4 is a view similar to Fig. 3, with the parts relaxed just prior to a final clamping operation;

Fig. 5 is a perspective view of an element of the structure of Fig. 1;

Fig. 6 is an enlarged fragmentary view of an alternative construction according to the invention;

Fig. 7 is a view similar to Fig. 6 to illustrate a further alternative construction;

Fig. 8 is a sectional view of another brush assembly incorporating features of the invention, the section being taken in a radial plane of the assembly; and

Fig. 9 is an enlarged sectional view taken in the plane 9—9 of Fig. 8.

Briefly stated my invention contemplates a novel brush assembly incorporating a plurality of generally longitudinally extending brush-strip elements, held in angularly spaced relation by a number of axially spaced supporting means. The supporting means includes slots having openings to receive parts of the brush elements, and the walls of the slots may converge toward the openings of the slots. Wedge means are provided for effectively narrowing the openings of the slots, whereby the brush binders may be secured to the support.

In one of the forms to be described, the sup-

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porting assembly includes a generally circular plate having a plurality of angularly spaced radially outwardly opening slots to receive a corresponding plurality of brush binders. Each of the slots is further defined by corresponding slots in brackets or clips mounted on one or both sides of the plate. Each bracket or clip has one face at an obtuse angle with a second face, and one of the faces has a converging slotted opening of the character indicated. By clamping the other face of the bracket or clip to the plate, the face having the slot is wedged to a steeper angle with the plate, and the net result is effectively to narrow the opening of the slot, thus clamping the brush binder between the walls of the slot.

In another preferred form, the supporting member may comprise two generally circular plates each having more or less aligned radially outwardly opening slots, and in this form eccentric means cooperate between the plates to displace the plates angularly with respect to each other, whereby the walls of aligned slots are caused to converge.

Referring to Figs. 1 and 2 of the drawings, my invention is shown in application to a drum-type brush assembly comprising a plurality of angularly spaced longitudinally extending brush-strip members 15, supported and retained by a plurality of axially spaced supporting members 16. Each of the supporting members 16 preferably includes a boss or hub 17 to engage a shaft (not shown), and each hub 17 may include a set screw 18 for securing the assembly to said shaft.

In accordance with a feature of the invention, each supporting member 16 also includes a plate 19, which in the form shown is generally circular. The plate 19 may be formed with a plurality of brush-retaining slots 20 to receive the binders 21 of brush elements 15. In order to secure the binders 21 in their located positions within slots 20, means are provided for effectively converging the walls defining said slots. In the form shown, a pair of brackets or clips 22 are carried by the plate 19 for each slot opening, that is, for each brush binder 21 to be secured to the support 16. Each bracket or clip 22 preferably comprises a first face 23 and a second face 24 at an obtuse angle with respect to each other. One of these faces, say, the outer face 23, may be formed with an opening, such as a slot 25, defined by opposed walls 26—27 having converging portions toward the opening of slot 25. The contour presented by walls 26—27 is preferably more or less in conformity with the cross-section of

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the brush binder 21, with a slight clearance to permit ready insertion of the binder 21 in slot 25, and with the convergent portions of the slot walls embracing or extending around the thickest part of the brush binder. Of course, the convergent portions could embrace the upper edge of the brush binder, but in the form shown the convergent section of the brush binder 21 permits the bracket or clip 22 to embrace the binder 21 securely without engaging the upper edge of the binder 21. The other face 24 of the bracket 22 may include suitable securing means for anchoring the same to a face of the plate 19. In the form shown, a hole 28 in the face 24 may loosely accommodate nut-and-bolt or other securing means 29 for attachment to the plate 19. Two brackets 22 may be clamped by the same securing means 29 to the plate 19, for each binder 21 to be secured.

It will be clear, by reference first to Fig. 4 and then to Fig. 3, that the described assembly may be quickly effected by slidably inserting brush binders 21 through the slots 25 of the appropriate brackets 22 and through the locating slots 20 on the support plates 19. With the bracket-securing means 29 relaxed (see Fig. 4), there may be ample clearance for such sliding insertion. Once properly inserted and located, a simple take-up of the securing means 29 into, say, the relationship shown in Fig. 3 will forcibly increase the inclination of the outer bracket faces 23 with respect to the brush binder 21, and at the same time the convergence of the opposed slot walls 26—27 will be effectively narrowed. This narrowing, as produced by the securing means 29, may very securely clamp binders 21 in their final positions.

In certain assemblies, particularly wherein a large plurality of angularly spaced brush strips 15 may be required, say, when twice the number shown in Fig. 2 are needed, it may be desirable to form the brackets or clips 22 with a greater number of slots. Such a construction is illustrated in Fig. 6, wherein the outer bracket face 23' is shown formed with two slots 30 having the same general proportion as the slots 25 of the Fig. 1 arrangement. In the form shown in Fig. 6, a single securing means 31 may serve the bracket 22' and hence a plurality of brush elements 15. If desired, the central axes of the slots 30 may be inclined with respect to each other as shown in Fig. 6, so as to promote proper radial orientation of all brush elements 15.

In certain applications, particularly when the frictional or scouring forces to be encountered by brush elements 15 are not great, it may not be necessary that the supporting plates 19 include locating slots 20 as described for Fig. 1. In such cases, and with reference to Fig. 7, a supporting plate 32 may be entirely adequate. In the form shown, the plate 32 is formed with a continuous circular periphery, and the same brackets or clips 22 may be employed with their slots 25 embracing and locking the brush binders 21. It will be clear that in the form shown in Fig. 7, the only forming operations needed for the supporting plate 32 will be the provision of suitable holes to accommodate securing means 33 and of appropriate means for attachment to bosses or hubs 16 or to a mounting shaft (not shown).

In Figs. 8 and 9, I show another embodiment of the invention in which alternative means are employed for effectively narrowing the brush-retaining slots in order to secure brush binders

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to the supporting structure. In the form shown, the supporting structure comprises two plates 34—35, which may have similar outer peripheries, each formed with a corresponding plurality of radially outwardly opening slots 36 to receive brush binders 21. Again, the walls of the slots 36 are preferably such as to converge toward the openings of the slots and to provide, when in general alignment, sufficient clearance for the ready insertion of binders 21.

In accordance with a feature of the invention, cam means are provided for relatively rotating one of the plates 34—35 with respect to the other of said plates. In the form shown, eccentric means 37 may effect such relative displacement. The eccentric means 37 may include a bearing portion 38 journaled, say, in the plate member 34, and an eccentric 39 to engage the other plate member 35. The bearing portion 38 may be formed integral with a cap 40 to engage the side of plate 34 and with a shank 41 threadedly to receive a tightening nut 42. If desired, adjustable means such as a socket 43 may be provided at the end of shank 41, whereby relative adjustment of the nut 42 and of the shank 41 may be effected from one side of the supporting assembly. The eccentric 39 may be keyed to the member 40, as at 44, whereby an adjustment of the socket 43 may effect eccentric rotation. Once an eccentric setting has been made, the nut 43 may serve to tighten the assembly.

The eccentric 39 preferably engages a slot 45 in the plate 35, whereby eccentric movement may impart only relative angular movement to the plates 34—35. The slot 45 thus preferably extends generally radially of the supporting assembly. If desired, the supporting assembly may be made more rigid by the employment of securing means 46 angularly displaced about the plate assembly. Preferably, the securing means 46 is associated with the plates 34—35 in such a way as to permit free angular displacement of these plates. Thus, if the securing means 46 is a screw, as shown, the shank of such screw preferably is slidable in an arcuate slot 47 in one of the plate members 34—35 through which it passes.

If desired, for purposes of enhancing the effectiveness of the complete assembly, a third plate member 48 may also be employed. In the form shown, and preferably, the third plate member 48 cooperates with the plate 34 to sandwich the plate 35 to be actuated by eccentric 39. The three-plate construction thus not only provides a simple means for retaining the eccentric means 37 but also an improved wedging action at slot 36, as will be clear.

It will be clear that I have described a number of relatively simple structures for very readily accommodating the assembly of brush elements to form a drum-type brush. The brush elements of the assembly may be straight, as shown and described, or they may be spiralled and held in spiralled relation by my supporting means. My supporting structures are such as to permit easy disassembly for servicing and for maintenance; for example, particularly in the case of brush assemblies in which the brush elements are sufficiently spaced, screw drivers or wrenches may be held and operated between supporter plates so as to effect binding adjustments on the brush elements. By an extended use of sheet-metal construction, not only can the cost of producing the assembly be materially reduced, but also the cost of producing a complete brush assembly.

While I have described my invention in detail for the preferred forms shown, it will be understood that modifications may be made within the scope of the invention as defined in the appended claims.

I claim:

1. In combination, a frame member, a brush strip to be secured to said frame member, said brush strip having an elongated binder for bristles, a bracket member having a first face and a second face at an obtuse angle with respect to each other, said bracket having a binder-receiving slot in one of said faces, said slot being defined by opposed walls converging toward the opening of said slot, and securing means for clamping the other of said faces of said bracket to said frame member, said elongated binder being within said slot and held by the converging walls of said slot to said frame member.

2. A combination according to claim 1, in which said frame member also has a slot opening in the same general direction as the slot on said bracket and generally aligned therewith, whereby the slot on said frame member may serve to locate a brush strip and the slot on said bracket may serve to anchor said brush strip.

3. As an article of manufacture, supporting means for a brush assembly, said supporting means including an integral unitary generally circular disc plate having a plurality of angularly spaced radially outwardly opening slots, said slots being of fixed widths and defined by opposed walls converging toward the openings of said slots, and securing means carried by said plate for securing a brush strip in one of said slots, said securing means including a plurality of independent members having outwardly opening slots with opposed convergent walls to receive separate brush strips held in separate disc slots, and independent adjustable means independently engaging said plate and said members for adjustably spacing corresponding slots on said members and on said plate whereby upon such adjustment brush strips may be secured to said plate.

4. In a generally cylindrical brush, a plurality of generally circular discs in spaced apart relationship, said discs having angularly spaced generally radially outwardly opening slots in the peripheries thereof, corresponding slots in said discs being in general alignment with each other, said slots having reduced peripheral openings, brush strips having elongated binders for bristles and extending through said slots in said

discs and held against radial removal by the reduced slot openings, and adjustable means engaging over parts of said binders for adjustably crowding said brush strips radially inwardly in said slots.

5. In the combination defined in claim 4, said means for crowding said brush strips radially in said slots being engaged with parts of said binders radially outwardly of the greatest transverse dimension thereof.

6. In the combination defined in claim 4, said means for crowding said brush strips radially in said slots comprising clips having slots for receiving said binders, and means for securing said clips to said discs, said securing means driving the slotted parts of said clips radially inwardly upon take-up of said securing means.

7. As an article of manufacture, a brush-strip anchoring device, comprising a bracket having a first face and a second face, said faces being at an obtuse angle with respect to each other, clamp-receiving means on one of said faces, the outer periphery of the other of said faces having a brush-binder-receiving slotted opening open outwardly to said outer periphery, confining means integral with opposed outer parts of the walls of the slotted opening and projecting toward each other and short of closing off the slotted opening, whereby a brush binder may be clamped by reaction on the brush binder between both said confining means on the one hand and the bottom of the slotted opening on the other hand.

8. An article according to claim 7, in which the periphery of said other face has a second brush-binder-receiving opening with integral confining means as for said first-mentioned opening.

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