

SPLIT BRUSHES

GENERAL REMARKS

Numerous experiments have been carried out with various methods of assembly and mounting of split brushes. The most common one is to join the sections of the brush by means of a metal plate rivetted onto one of the sections (*Fig. 1*).

After this, a rubber shock absorber appeared, combined with a metal plate, of which there are a number of varieties (*Figs. 2 to 5*), or used alone: that is to say, in the latter case, the mounting is achieved by means of a "glued" rubber bridge (*Fig. 6*).

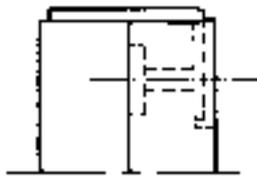


Fig. 1

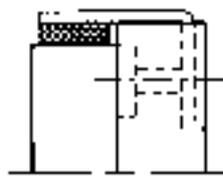


Fig. 2

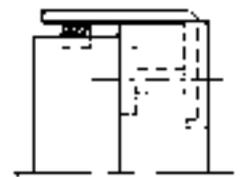


Fig. 3

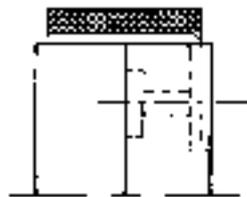


Fig. 4

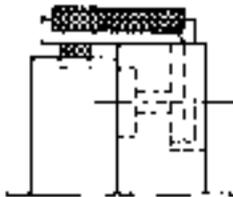


Fig. 5

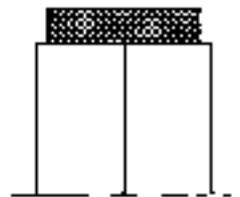


Fig. 6

All these systems have certain disadvantages: with or without the rubber, the metal plate does not assure identical functioning of the brush elements in both working directions, as the mounting is not "symetrical".

On the other hand, and especially in the case of unequal wear of the sections, the brush without a plate ("leading" brush) does not receive the thrust from the pressure system.

With the rubber bridge, the mounting is symetrical, but the thrust is not always equally divided along the whole surface of the brush. Furthermore, the rubber restricts the displacement of the pressure finger when the brush reduces in length due to wear.

TWO ADVANTAGEOUS TYPES of SHOCK ABSORBERS

Following the good results obtained on *all* types of machines, a general approval is given to a method of mounting which eliminates all the disadvantages afore mentioned; this is mounting with "a rubber shock absorber and a hard plate".

Place directly on the brush, the layer of rubber is surmounted by a plate of hard material, non metallic.

According to the particular circumstances, the layer and the plate are simply threaded onto the flexibles, without gluing (*Fig. 7*), or glued one to the other and to the brush (*Fig. 8*), with two variations in that the rubber may be whole (*8a*) or split into two parts generally along its largest dimension (*8b*).

- a) For systems with oblique pressure.
- b) For systems with vertical pressure.

The mounting is called "SILTIC" when the rubber is silicone and the plates are glued (*Fig. 8*).

Please note

These two systems of shock absorption are of advantage from the point of view operational safety, because neither system contains any pieces of metal which may become detached by vibration, and fall onto the commutator or ring whilst running.

Furthermore, system 8 has the advantage of leaving flexible connections exposed; thus the cooling of these is not adversely affected should the brushes suffer considerable overloading.

CHOICE of MATERIAL

Hard plate

The purpose of this part is to distribute uniformly the thrust of the finger across the whole surface of the brush. It must be made from a hard material, indeformable at high and low temperatures - and resistant to a temperature of 150°C without damage or evolve substances likely to poison commutator or brush surfaces.

Furthermore, it should be capable of taking a highly polished surface which will permit an easy sliding movement of the pressure finger over the surface.

Shape is determined by the type of pressure system. It may be flat (*Fig. 8*), grooved (*Fig. 9*) or rounded (*Fig. 10*).

Rubber layer

The rubber is used on the brush as a means of absorbing vibration.

According to the application, two different types of rubber are used:

- Neoprene (rubber Shore 70) a good shock absorber when temperatures do not exceed 90° permanently. At higher temperatures, the rubber "ages" and progressively loses its elasticity;
- silicone (rubber Shore 40), the suppleness of which does not alter at 250° and more. Because of these unusual heat resistant properties, silicone is being used more and more as a shock absorber.

CHOICE of MOUNTING

When the pressure system descends in a vertical rectilinear direction, the point of application on the brush is fixed.

In this case only, and when the thrust is well centered, mounting with an unglued plate may be suitable (*Fig. 7*).

It should be noted that this type of fitting necessitates four flexibles per brush to hold the plates in position.

For all other systems of pressure, mounting with a glued plate is advisable.

A monoblock shock absorber (*Fig. 8a*) or split (*Fig. 8b*) is selected in accordance with the desired relative degree of mobility of the separate pieces of the brush.

Please note

On brushes with a top bevel, the two plates (layer of rubber and hard plate) must be glued together (*Fig. 11*).

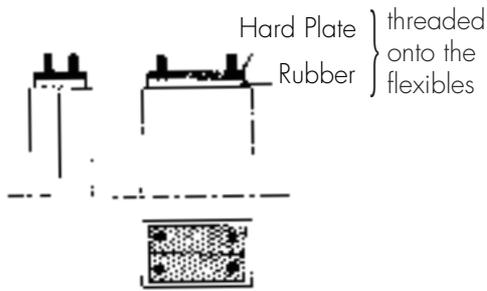


Fig. 7

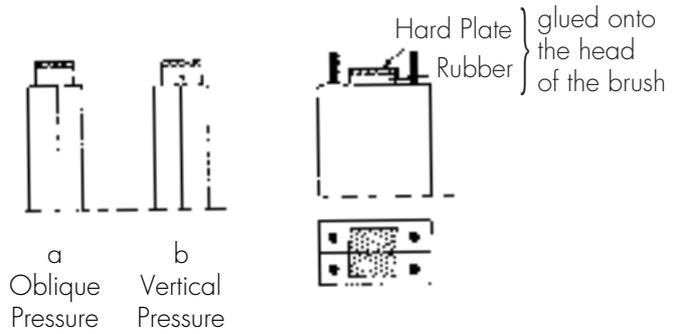


Fig. 8

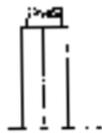


Fig. 9



Fig. 10

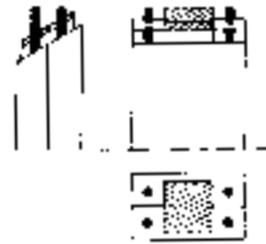


Fig. 11





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