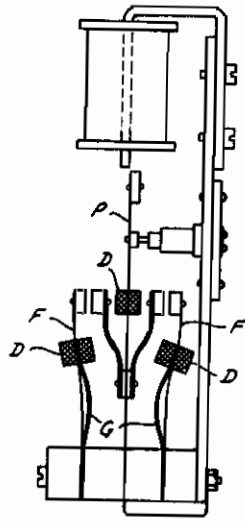


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The losses occasioned in a chopper are largely due to the contact resistance set up at the contacts of the chopper. This contact resistance, in turn, is a function of the contact or bearing pressure and the ratio between the closing and the opening times of the contacts. Also the difference in the surfaces of the contacts play a rather important part. Harmful wear by heat action and migration of material at the contacts are avoided by avoiding unduly high crest currents and potentials by choosing suitable dimensions for the circuit elements. It has been discovered that in spite of the fact that these requirements are fulfilled, sparking is still too strong and that as a consequence wear and tear of the contacts is excessive and the efficiency of operation of the chopper too low.

According to the invention, to avoid these difficulties, damping materials are attached or laced contiguous to the springs which support the contacts or terminals. It will be seen that the choppers known in the prior art represent oscillation systems involving very low damping. When the terminals or contacts strike each other, thumping or rebounding, even if only slight, will always arise at the contacts; in other words, after the first contact or touch, the contact does not stay made, in fact vibration at natural frequency, particularly of the cooperating spring will arise due to the inherent resonance of some parts of the spring including the mass of the contact and this results in reiterated opening and closing of the contact. However, by placing damping on the spring or springs, such thumping will be avoidable.

The necessary damping or cushioning can be insured by attaching by pasting or cementing damping material or inserting damping material inhering greater internal friction such as natural or artificial rubber, fabric of metallic gauze and the like. When so used, the elastic properties of the said damping material could at the same time to a small or appreciable part act as the restoring or retractile force of the springs.

An exemplified embodiment of the invention is shown in the appended drawing. The vibratory springs is indicated at P and the counter springs or cooperating springs by F. Against these are placed so-called stops or abutments indicated at G which are designed to prevent these counter springs, upon the return of the vibratory spring towards the median position, from continuing to oscillate for this would prevent the opening of the contact. According to this invention, damping or cushion rings D made of rubber or metal gauze, are fitted over the various springs. For the counter springs at the same time the restoring force will be thus augmented inasmuch as the rings tend to retain the counter springs on the stops.

In order that undue heating of the damping material may be avoided, the distance between the contact and the damping material may be increased by interposing, for instance, an insert consisting of insulation material or metal. If a rubber sheath is slipped over all of the springs conjointly, which will exert pressure directly against the springs, this at the same time may secure acoustic damping or deadening of noise.

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