2.2.2 Contacts

- **Contacts**, meaning **mechanical contacts** here, are a major part of most electronic products. Even if there is no mechanical switch anymore, you still have the contact between the plug and the outlet, and/or the contact springs for the batteries.
- *Contacts* include the following items:
  - Switches, ***plugs***, relays, connections to removable parts (batteries, light bulbs, ...), ***pantographs*** (the thing on top of a locomotive), "brushes" (for motors), and so on.
  - Contacts are also the components or materials that often cause *trouble*. Contacts or switches are often the first components to break, and thus a nuisance to consumers like you and me.
- There are many specific requirements for **contact materials**:
  - Small contact resistance (it is never zero).
  - No sticking or welding under load.
  - No ***abrasion*** under load.
  - No intermixing of materials.
  - No wearing and tearing.
  - Suitable mechanical properties, e.g. good elasticity (forever) for switches.
- There are specific materials and group of materials generally favored for contacts:
  - **C** (graphite in many forms) for pantographs and whenever you want to draw a big current.
  - **Cu**, **Ag**, **Au**.
  - **Ru**, **Rh**, **Pd**, **Os**, **Ir**, **Pt**.
  - **Mo**, **W**.
  - ….
  - An example of **Ag**-based contact materials can be found in the link.
  - For contact applications we find *expensive* materials, because in many applications only small quantities are needed and the inertness of noble metals is what counts.