

1 Upper connection	7 Opening spring
2 Vacuum interrupter	8 Shift lever
3 Lower connection	9 Mechanism housing with spring operating mechanism
4 Roller contact (swivel contact for 630 A)	10 Drive shaft
5 Contact pressure spring	11 Pole tube
6 Insulated coupling rod	12 Release mechanism

# Electric arc

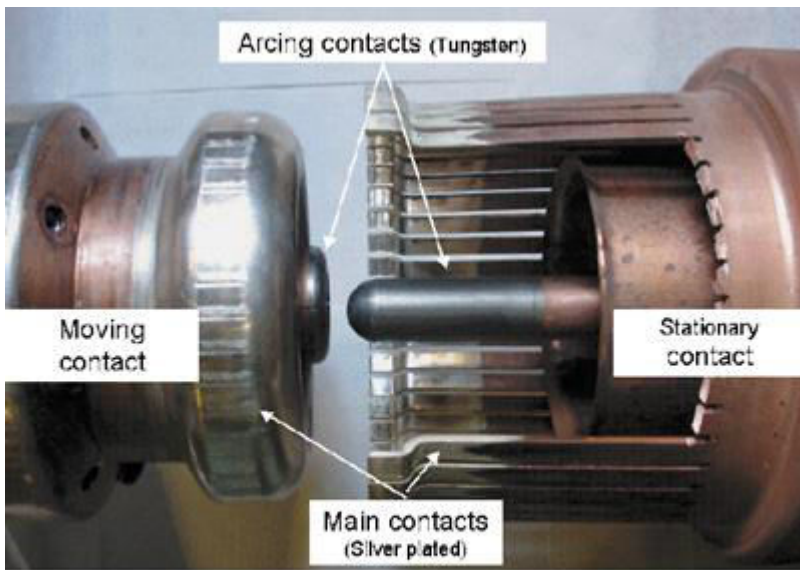
- **High-Pressure Arc** : Present in blast type CBs, great heat and deposits solid particles
- **Vacuum Arc** : limited and of short duration , no deposition of by-products

# Contact Architecture

- Contacts have to withstand the arc's heat
- They also need to have good conduction properties.
- Tungsten alloys have good resistance-to-arc properties but less conductivity
- Copper and silver have great conductivity but relatively poor resistance-to-arc properties

# Sliding Contacts

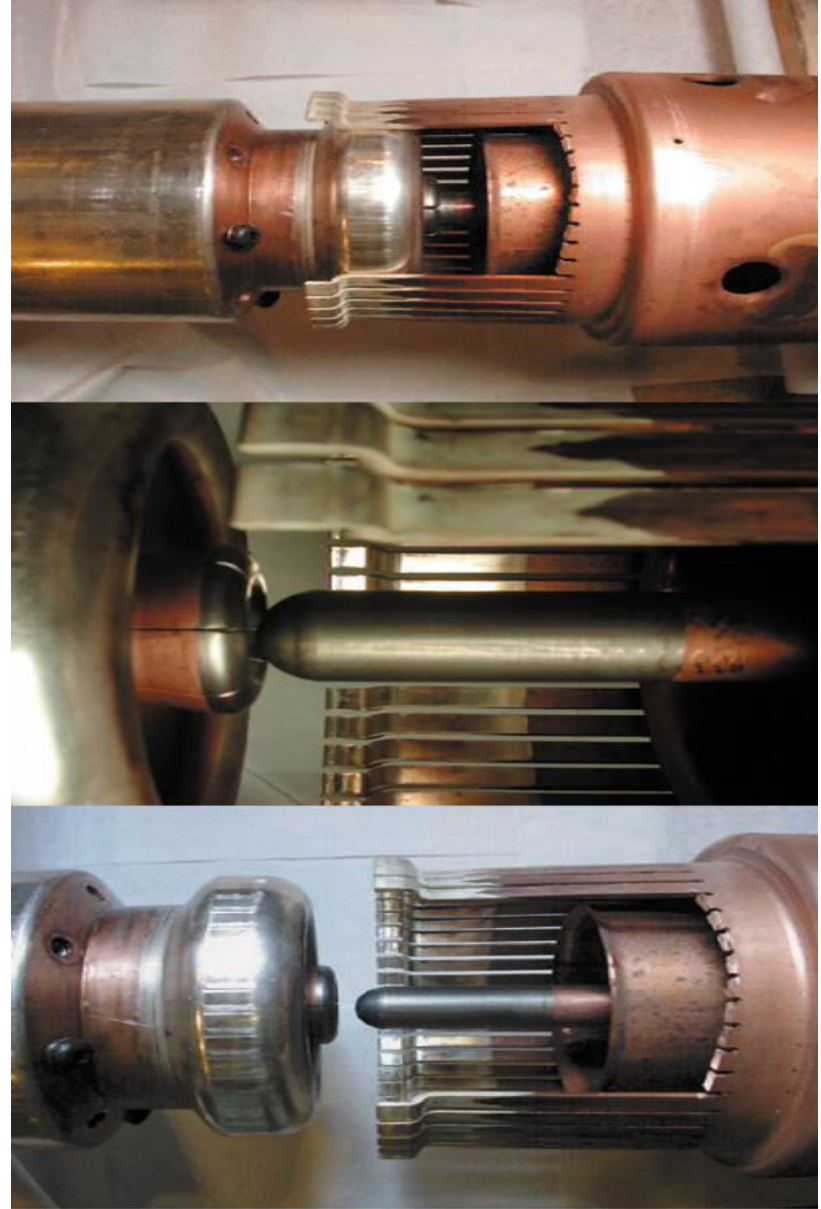
- Arcing contacts made of tungsten
- Main (Current carrying) contacts silver plated copper
- Sliding wipes off deposits
- Flexible structure made of fingers



**Fig 10a** Tulip contacts in SF6 circuit breaker



**Fig 12** Butt contacts short distance 9.5 mm used in vacuum interrupter in vacuum circuit breaker



**Fig 10b** Contacts shown in Closed-Arc starting step-Opened position

# Comparison of Circuit Breakers

Factor	Oil Breakers	Air Breakers	Vacuum/SF6
Safety	Risk of explosion and fire due to increase in pressure during multiple operations	Emission of hot air and ionized gas to the surroundings	No risk of explosion
Size	Quite large	Medium	Smaller
Maintenance	Regular oil replacement	Replacement of arcing contacts	Minimum lubrication for control devices
Environmental factors	Humidity and dust in the atmosphere can change the internal properties and affect the dielectric		Since sealed, no effect due to environment
Endurance	Below average	Average	Excellent