

The influence of light on northern and southern architectural design. In the south spatial forms are aligned to the correlation of the steep angle of incident sun-light and light reflected from the ground. In the north it is the low angle of the sun's rays that affects the shape of the buildings.

fluting on columns have a three-dimensional effect even if they are of shallow depth. Such details require far more depth under diffuse light to achieve the same effect. Facades in southern countries therefore only needed shallow surface structures, whereas the architecture of more northern latitudes – and the design of interior spaces – was dependent on more pronounced forms and accentuation through colour to underline the structure of surfaces.

But light does not only serve to render spatial bodies three-dimensional. It is an excellent means for controlling our perception on a psychological level. In old Egyptian temples – e.g. in the sun temple of Amun Re in Karnak or in Abu Simbel – you will not find light in the form of uniform ambient lighting, but as a means to accentuate the essential – colonnades that gradually become darker allow the viewer to adapt to lower lighting levels, the highlighted image of the god then appearing overwhelmingly bright in contrast. An architectural construction can function similar to an astronomical clock, with special lighting effects only occurring on significant days or during particular periods in the year, when the sun rises or sets, or at the summer or the winter solstice.

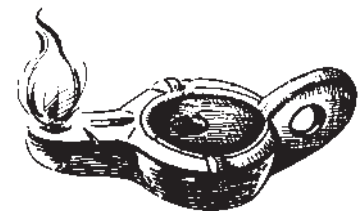
In the course of history the skill to create purposefully differentiated daylighting effects has been continually perfected, reaching a climax in the churches of the Baroque period, – e.g. the pilgrimage church in Birnau or the pilgrimage church designed by Dominikus Zimmermann in Upper Bavaria – , where the visitor's gaze is drawn from the diffuse brightness of the nave towards the brightly lit altar area, where intricate wood carvings decorated in gold sparkle and stand out in relief.

### 1.1.2 Artificial lighting

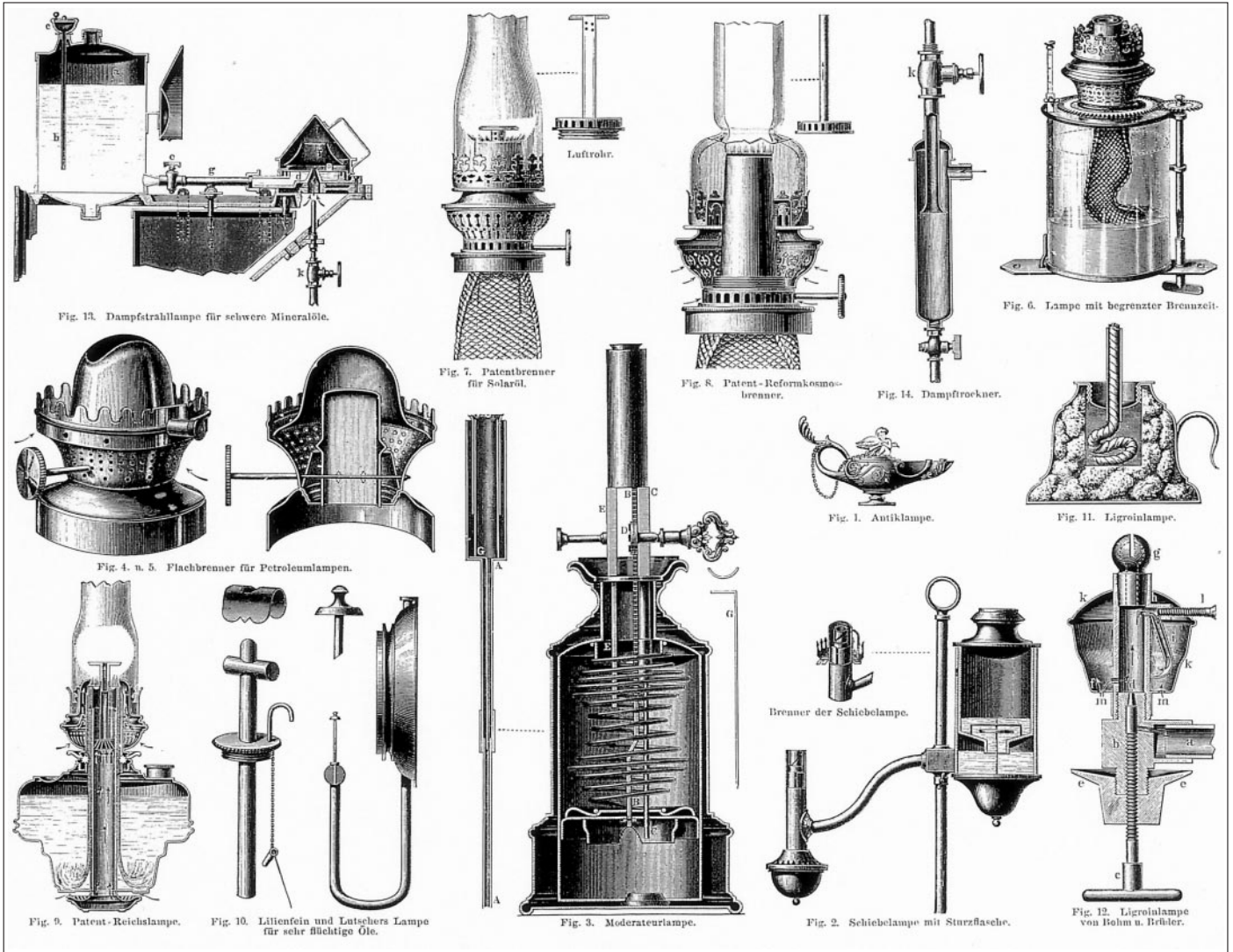
A similar process of perfection also took place in the realm of artificial lighting, a development that was clearly confined by the inadequate luminous power provided by the light sources available.

The story began when the flame, the source of light, was separated from fire, the source of warmth - burning branches were removed from the fire and used for a specific purpose. It soon became obvious that it was an advantage to select pieces of wood that combust and emit light particularly well, and the branch was replaced by especially resinous pine wood. The next step involved not only relying on a natural feature of the wood, but, in the case of burning torches, to apply flammable material to produce more light artificially. The development of the oil lamp and the candle meant that man then had compact, relatively safe light sources at his disposal; select fuels were used eco-

Oil lamp made of brass



Greek oil lamp, a mass item in the ancient world



Lamps and burners dating back to the second half of the 19th century, copper engraving. Based on the construction of the Argand burner, the oil lamp was adapted through numerous technical innovations to meet a wide variety of requirements. The differences between lamps with flat wicks and those with the more efficient tubular wicks are clearly evident. In later paraffin lamps the light fuel

was transported to the flame via the capillary action of the wick alone, earlier lamps that used thick-bodied vegetable oils required more costly fuel supply solutions involving upturned glass bottles or spring mechanisms. In the case of especially volatile or thick-bodied oils there were special wickless lamps available that produced combustible gaseous mixtures through the inherent vapour pressure produced by the volatile oil or by external compression.