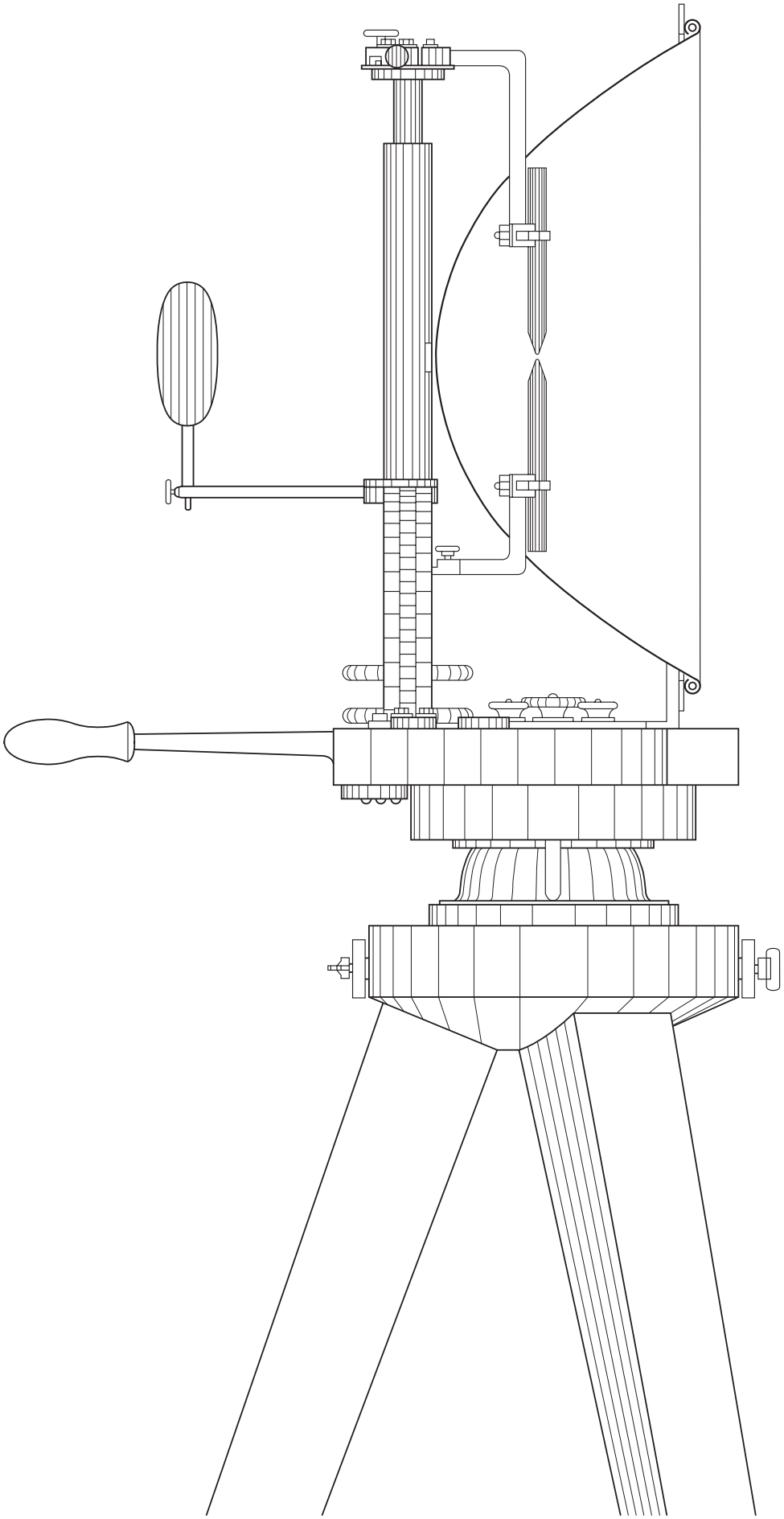
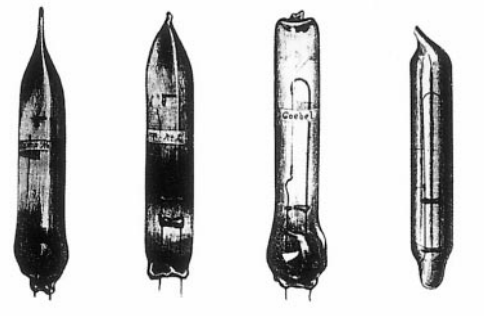


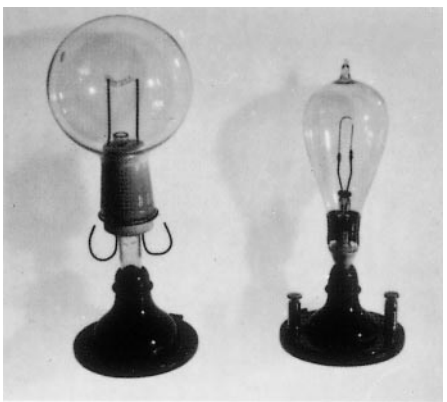
Siemens' arc lamp dating back to 1868. According to the description: an adjustable spotlight complete with "concave mirror, carriage, stand and anti-dazzle screen" – the oldest luminaire in Siemens' archives documented in the form of a drawing.

Heinrich Goebel, experimental incandescent lamps (carbon filaments in air-void eau-de-cologne bottles).



Joseph Wilson Swan, Swan's version of the incandescent lamp with graphite filament and spring base.

Thomas Alva Edison, Edison lamps, platinum and carbon filament version, as yet without the typical screw cap.



About mid-century self-adjusting lamps were developed, thereby eliminating the problem of manual adjustment. Generators that could guarantee a continuous supply of electricity were now also available. It was, however, still only possible to operate one arc lamp per power source; series connection – "splitting the light", as it was called – was not possible, as the different burning levels of the individual lamps meant that the entire series was quickly extinguished. This problem was only solved in the 1870s. The simple solution was provided by Jablotschkow's version of the arc lamp, which involved two parallel carbon electrodes set in a plaster cylinder and allowed to burn simultaneously from the top downwards. A more complex, but also more reliable solution was provided by the differential lamp, developed in 1878 by Friedrich v. Hefner-Alteneck, a Siemens engineer, whereby carbon supply and power constancy were effected via an electromagnetic system.

Now that light could be "divided up" the arc lamp became an extremely practical light source, which not only found individual application, but was also used on a wide scale. It was in fact applied wherever its excellent luminous intensity could be put to good use – once again in lighthouses, for stage lighting; and, above all, for all forms of street and exterior lighting. The arc lamp was not entirely suitable for application in private homes, however, because it tended to produce far too much light – a novelty in the field of lighting technology. It would take other forms of electric lighting to replace gas lighting in private living spaces.

It was discovered at a fairly early stage, that electrical conductors heat up to produce a sufficiently great resistance, and even begin to glow; in 1802 – eight years before his spectacular presentation of the first arc lamp – Humphrey Davy demonstrated how he could make a platinum wire glow by means of electrolysis.

The incandescent lamp failed to establish itself as a new light source for technical reasons, much the same as the arc lamp. There were only a few substances that had a melting point high enough to create incandescence before melting. Moreover, the high level of resistance required very thin filaments, which were difficult to produce, broke easily and burnt up quickly in the oxygen in the air.

First experiments made with platinum wires or carbon filaments did not produce much more than minimum service life. The life time could only be extended when the filament – predominantly made of carbon or graphite at that time – was prevented from burning up by surrounding it with a glass bulb, which was either evacuated or filled with inert gas. Pioneers in this field were Joseph Wilson Swan, who preceded Edison by six months with his graphite lamp, but above