Nils Dalén Biography

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Biography

As an agriculture student, Dalén appeared ready to follow his father into farming. However, at school he designed and constructed several improved variations of farm equipment, prompting a businessman to encourage him to pursue a technical education. After graduating with a degree in mechanical engineering, Dalén joined the Swedish Carbide and Acetylene Company as technical chief in 1901. This company was working on a way to improve a device called a gas accumulator, used to produce a safe and effective fuel for the illumination of lighthouses and buoys. It was comprised of acetylene (a hydrocarbon gas that burns with an extremely bright, white light), acetone (a highly flammable organic liquid), a porous mass used to absorb the solution of acetylene and acetone, and a metallic container. The problem was that no porous mass had yet been manufactured that adequately absorbed the acetylene gas. For that reason the gas tended to accumulate, creating the possibility of an explosion. Dalén solved the problem when he built a better gas accumulator. He produced a substance he called aga, put it in a steel container half-filled with acetone, and forced acetylene into the container under pressure of ten atmospheres. The risk of explosion was eliminated. He then invented a regulator to control the pressure of the gas inside the container. In 1905 he designed a reliable device that increased the number of brief flashes emitted by a lighthouse. In 1907 he created a special valve that prevented the gas accumulator from providing gas during bright days when the flashes were not necessary, thus saving a large amount of acetylene and acetone. Dalén was blinded by an explosion in 1912 while conducting an experiment with acetylene. He was awarded the Nobel prize for physics the same year for his aga lighting, which was not only used in lighthouses but also for trains, automobile headlights, welding, smelting, and cutting metals. He also invented an extremely efficient stove. In spite of his blindness Dalén continued to conduct research until his death.