

# UNDERGROUND DEVELOPMENT

## Gustaf Andersson and Erik Ryd



Erik Ryd

Gustaf Andersson and Erik Ryd were two of the many great engineers we have seen from Atlas Copco over its history of more than 125 years. They are fathers, along with Gustaf Ryd (Erik's father), and there are many others, of modern rock drilling. Other fathers of rock drilling were to be found in companies like Tamrock (Sandvik), Ingersoll-Rand, Gardner Denver and Montabert. Andersson and Ryd are the 2013 inductees, but cannot be remembered in isolation. The earlier work of Ryd's father Gustaf was essential (as was John Munck's support) to the further development of the Ryd and Andersson innovations that resulted in the 'Swedish Method' which made such an important advance in the science of development drilling.

Just before the start of WWI, Atlas entered into a new product area with great potential: compressed air machinery and compressors. It was the company's own need for good pneumatic tools and machines that fuelled

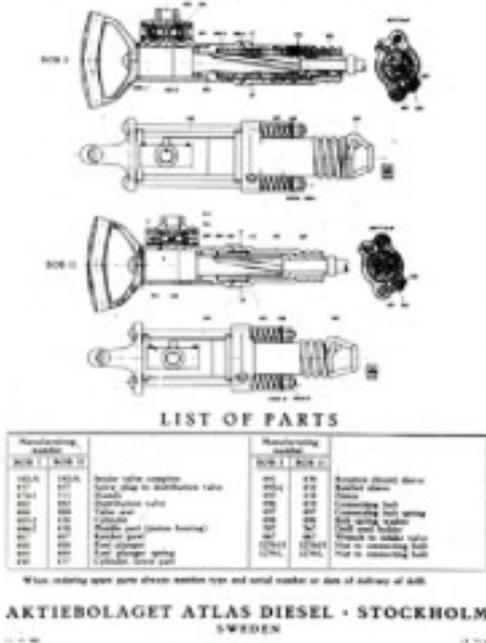
the interest and expertise with these products. On its own production line, pneumatic riveting and caulking hammers had become invaluable tools and the need soon arose for spare parts and replacements.

The first pneumatic riveting hammers and drills were officially introduced on the Atlas production line in 1901. Gustaf Ryd was the innovator of the first pneumatic hammers. In 1904 a piston compressor was launched, and in 1905, the first pneumatic rock drilling equipment was introduced. In 1910, Gustaf Andersson developed pneumatic chipping and riveting hammers with advanced design and a spool valve engine.

The oldest rock drills were fed manually using hand-cranked screw feeds. The feed devices were later improved through pneumatic, telescopic feed (which was applied by Atlas as early as 1907 on the Cyclops model) and mechanical feed with a chain or screw, powered by engines or cylinders.

# Atlas

## ROCK DRILLS BOB I AND BOB II



In parallel with the manufacture of hand-powered drills, a lightweight, ratchet-rotating machine was constructed by Atlas Copco in 1913 that would be suitable for porous rock types, such as limestone. This machine type, the BOB, was still in production until the 1930s when it was replaced by a lightweight, ratchet-rotating drill of the RH (Rotary-Handheld) type. A type that would have major significance for the company's continued development.

Andersson designed the RH Series, which entered production in 1930 with the RH-70, a drill intended for hard rock. The most important of these lightweight, handheld drills was the RH-65 from 1932. The machine came to constitute the most important link in the successful 'Swedish Method': a lightweight drill on a pusher leg and equipped with hardened metal bits.

Although the first machine in the RH-series introduced in 1930 was the RH-70, real success came two years later, with the introduction of the RH-65, a smaller version of RH-70 with double tubes for water-flushing and a longer

rotation chuck for 108 mm drill shank.

The pusher leg was developed during the latter part of the 1930s under the leadership of the chief designer at the time, Erik Ryd. The 'Swedish Method' gained rapid acceptance. The predecessor of the pusher leg was a simple board. Miners in German coal mines often placed a plank against the machine's grip to bear the weight of the machine.

Erik Ryd, as a newly graduated rock-drilling engineer, was taken on as senior laboratory technician at Atlas Diesel. He led crucial development work in the field of compressed-air technology in the 1920s and 1930s. When the company opened up its first design office for pneumatic tools, he was appointed its head. He developed close contact with Josef Hollertz, then field salesman, who taught him to always act according to customer needs.

Ryd had a sound knowledge of materials and heat-treatment in combination with an extraordinary desire to improve his customers' productivity. This combination of qualities inspired him to develop, in collaboration with John Munck, an expert on the strength of materials, a pneumatic rock drill that was light, strong, and efficient. This one-man machine, introduced in 1936, could be equipped with a pneumatic pusher leg that rationalized rock drilling considerably.

During WWII the new machine was tested in the construction of Sweden's underground defense facilities and in the country's mining businesses. Different bits were used to drill through Sweden's hard rock types. In terms of cost per meter drilled, very good results were obtained with tungsten carbide drill bits. By the end of the war years it was clear that the innovative and well-tested combination of a strong but light drill with a pneumatic pusher leg and tungsten carbide drill bits gave exceptional performance.



Application of a lightweight Atlas Copco drill with pusher leg in a Swedish mine  
After the wars, Atlas worked on increasing exports. In post-war Europe competition was tough and prices were low on drilling equipment. The General Manager at the time, Walter Wehtje, realised the company had to offer the customers something more than the actual drilling tool in order to compete on foreign markets. Atlas presented the 'Swedish method', a modern and lighter drilling technology, compared to conventional heavier methods. It combined a light rock drill with

pusher leg and drill steels with tungsten carbide drill bits. By the Swedish method one man could handle one machine and the method became known all over the world as the superior productivity solution in rock drilling technology.