Johan August Brinell

-Inventor of the Brinell test and a pioneer in the metallurgical research of the properties of steel and iron

Martin Öberg
Department of Solid Mechanics
Royal Institute of Technology, KTH, Stockholm

Continueed as an engineer at Lesjöfors Ironworks 1875

Born in Bringetofta 1849

Chief technical manager at Fagersta Ironworks 1882

Studied at Borås Technical school

Superintendent at Jernkontoret in Stockholm 1903 - 1914

Began his career as a draughtsman at Nydqvist & Holm in Trollhättan 1871

Died in Stockholm 1925

Finspång Ironworks 1872

Fagersta Ironworks 1882 - 1903

Steelmaking since the early years of 1600.

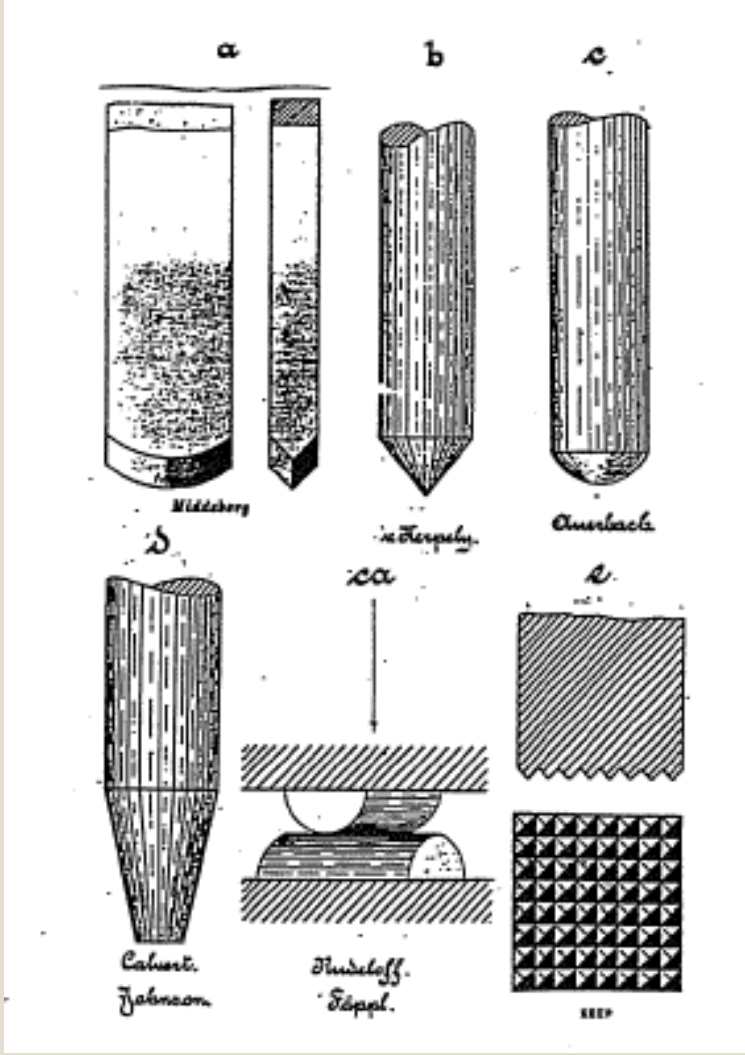
Brinell managed to increase production with 100 %.

Important research regarding the phase transformations in steel and the texture changes during heating and cooling.

Invention of the Brinell hardness test.

Earlier versions

Earlier versions of hardness indenters



Brinell hardness test

Requirements set out by Brinell for the test method:

1. It must give trustworthy results.

2. It must be easy to learn and to apply.

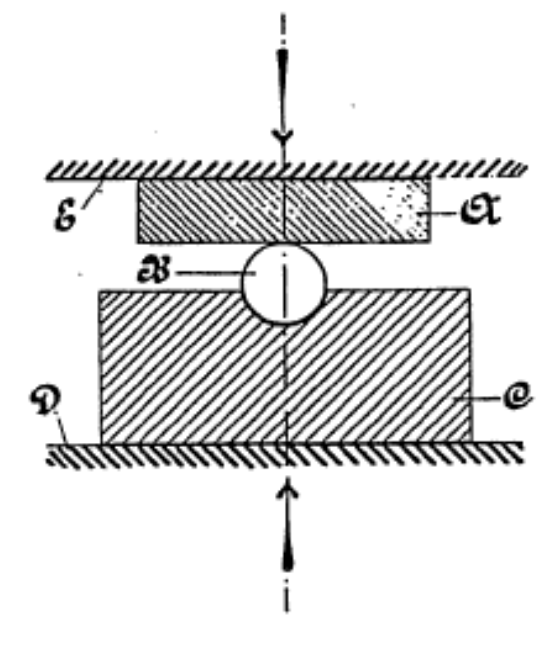
3. There should be no necessity for costly or time-wasting mechnical treatment of the material prior to the testing.

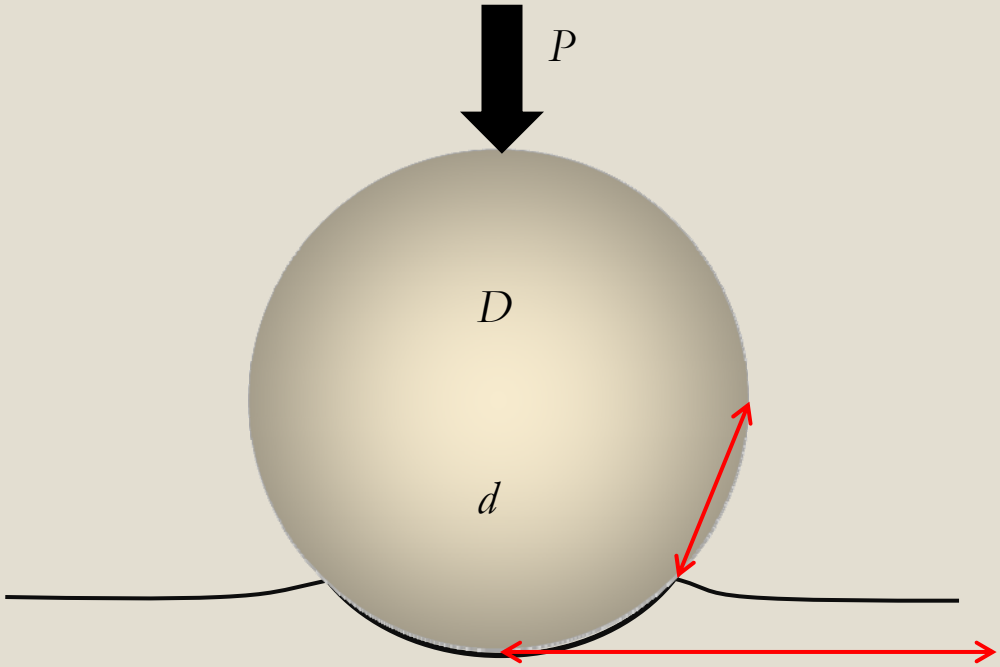
4. The testing indenter should be cheap, easy to obtain, incapable of altering its shape and of a sufficient hardness.

5. The method should admit of finished articles being tested without damage to the objects.

6. The testing results should express the absolute hardness and not only the relative hardness.

Brinell hardness test

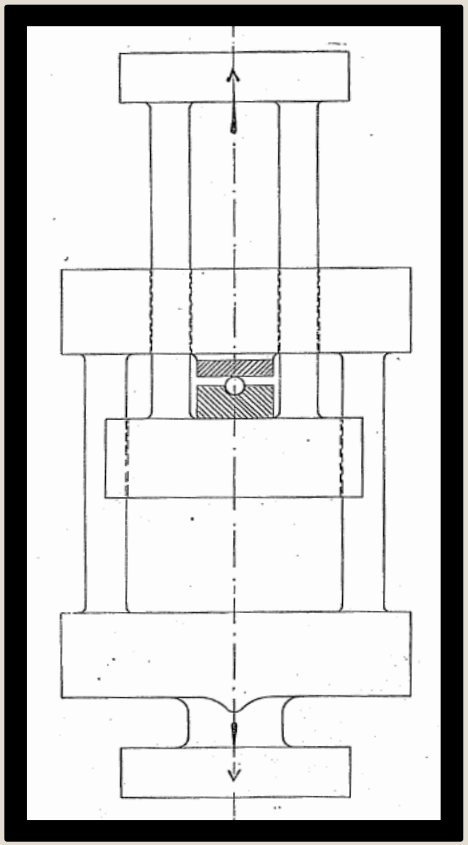




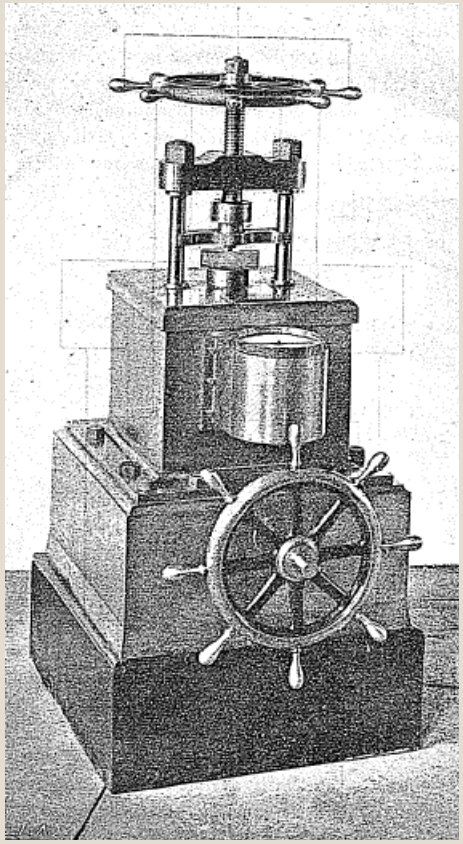
$$H_B = \frac{2P}{\pi D(D - \sqrt{D^2 - d^2})}$$

Brinell hardness testing machines

The first testing equipment was a fixture mounted in a testing machine

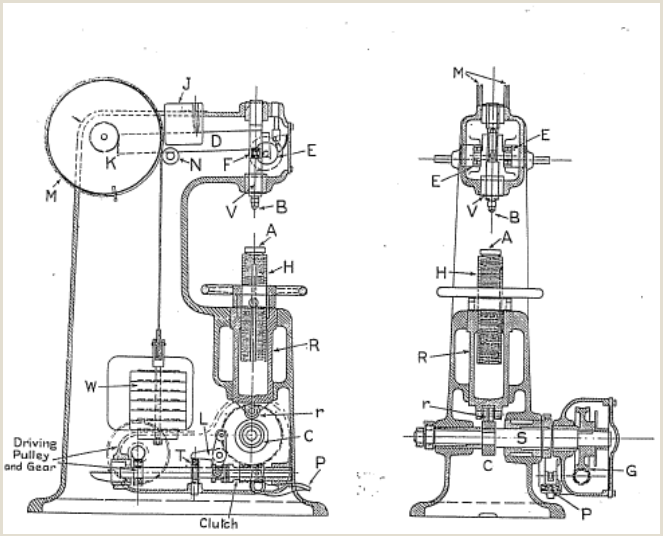


Brinell constructed the first testing device

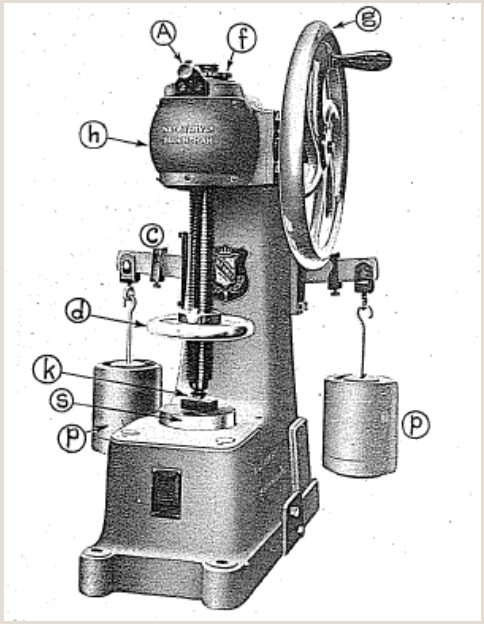


Swedish company Alpha AB continued with a design that were spread internationally…

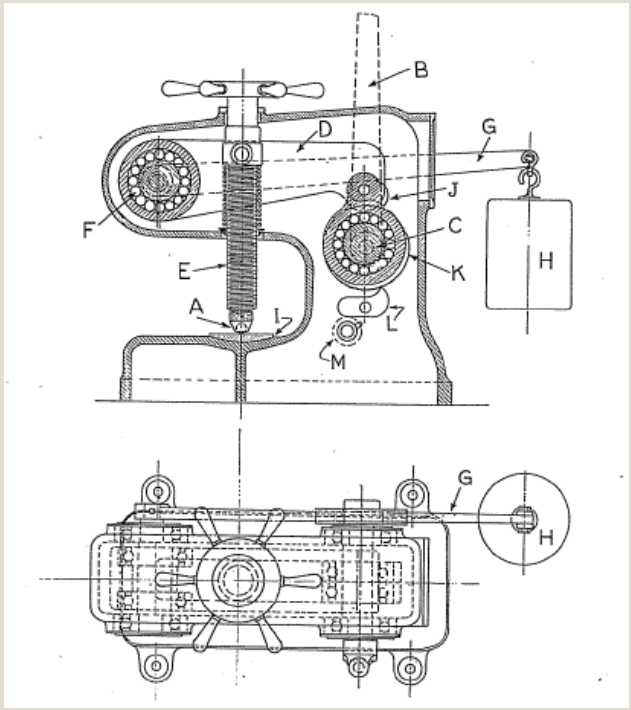
…and many others were to follow as the testing procedure gained users.



Herbert



Avery



Johnson

Brinell hardness testing machines today

Brinell's later assignments

Superintendent of the Swedish Steel Producers' Association, Jernkontoret, 1903 – 1914.

Member of the Royal Swedish Academy of Sciences from 1902.

Inspector at the Laboratory for Materials Testing at The Royal Institute of Technology, KTH, 1905 – 1914.

Member of the board of The Royal Institute of Technology, KTH, 1912 – 1914.

Member of the Royal Swedish Academy of Engineering Science from 1919.

Brinell's awards

1900: Grand Prix, world exhibition in Paris.

1900: Polhem medal, Svenska Teknologföreningen.

1907: Bessemer medal in gold, The Iron and Steel Institute, London.

1907: Honorary doctor at Uppsala university.

1914: Belöningsjetton in gold from Jernkontoret.

1921: Rinman medal from Jernkontoret.

Chevalier in the Legion of Honour, France.

The last years

Lived for some years in his birth region were he among other things invented a machine that made fences.

Returned to Stockholm and died in 1925.

Thank you!