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Roller Impact
Machine

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**ROYAL
GUNPOWDER
MILLS
WALTHAM ABBEY**

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The Newsletter of the
**ROYAL GUNPOWDER MILLS WALTHAM ABBEY
FRIENDS ASSOCIATION**

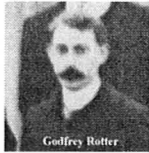


**DECEMBER
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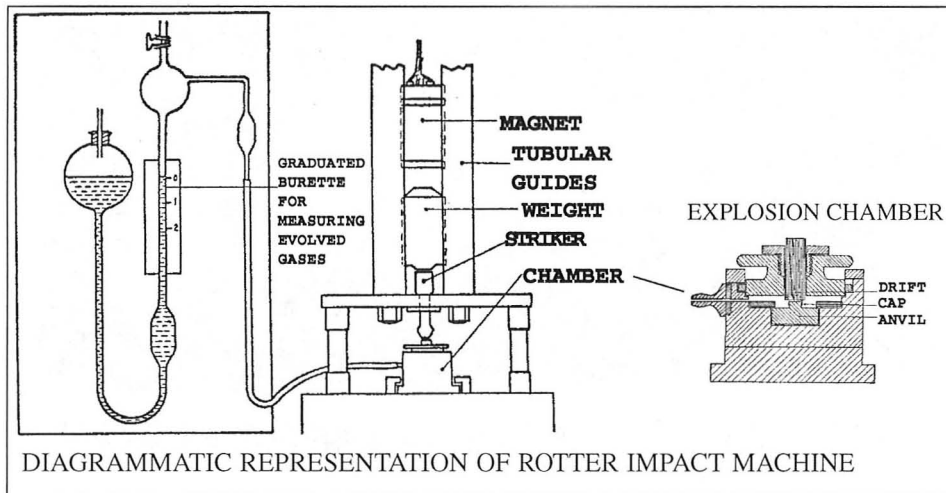
THE ROTTER IMPACT MACHINE

After the gunpowder era when a number of new and more powerful explosives began to be developed it became necessary to compare the relative sensitivity of these materials to shock. This was of extreme importance to those engaged in the manufacture and had direct influence on the design of manufacturing equipment and processes.



Around the turn of the 19th century Godfrey Rotter, working at the Woolwich Arsenal, designed an impact machine in which a weight was dropped onto a small sample of explosive. The height at which the falling weight caused the material to explode, termed 'a go' was recorded. For many reasons the results given by different machines in different locations tended to vary but using standard samples of certain explosives (eg picric acid) an universal ranking could be obtained.

Although various modifications have since been made to Rotter's original design, principally by Dr Poole in the early 1940's, it remains one of the standard safety tests for explosives using RDX as a reference standard. To cater for a diversity of materials there are drop weights of 1, 2 and 5kg, usually with a run of 10 drops at 5 heights around the 50-50 'go' point. Results are quoted as Figure of Insensitiveness or FoI.



Special thanks to:
 David Lee (ex WA and then HM Insp. of Explosives),
 Dave Mullenger (ex WA, currently at Fort Halstead)
 and Bill Love (ex Woolwich Arsenal)

FURTHER DETAILS ON THE ROTTER IMPACT MACHINE

Readers may be tempted to think that pieces of equipment which have been in use for many years and are regarded as setting standards for certain functions have been designed on strict scientific principles and the dimensions of important parts carefully calculated - but this was not always so, as I discovered.

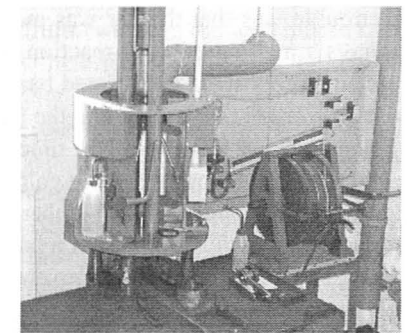
Whether by accident or design, the Sensitiveness Group was allocated building L149 which had a tall central tower and when Dr Poole became Chief Superintendent he decided that the tower was just the place for us to have our own Rotter Machine but incorporating certain 'improvements' of his design. He instructed me to "get the drawings from Woolwich and proceed a.s.a.p."

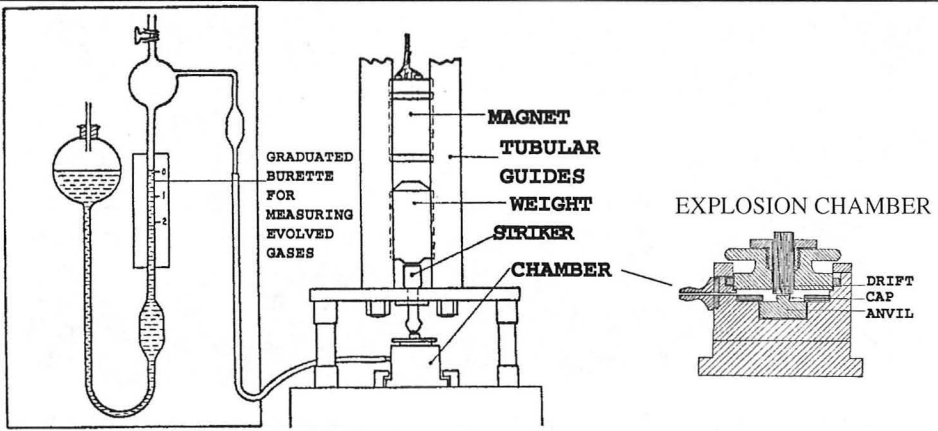
When I relayed this request to Woolwich it was met with a hollow laugh so I investigated further. My researches discovered that, when Dr Rotter conceived the idea for his impact machine, he had recourse to the scrap yard at the Arsenal. The main anvil was the butt end of a billet that had been used to turn a gun barrel and the weight guides were three pieces of 'T' iron that happened to be lying about. The electromagnet was recovered from the electricians scrap bin. It was the secondary anvils which proved to be the biggest surprise. These were made from some flat bar that had been bought for some long forgotten job and the major dimension just happened to be that produced by turning circular the squares produced by cutting up the bar. However, the 'pip' on which the sample rested was very carefully dimensioned indeed. When I asked why, I was told that the brass cups which fitted upside down to retain the sample was also rigidly specified, as they were used to make the percussion caps for a shell used in the Boer War and Dr Rotter had found a cache of some hundred of thousands of them which he had decided to use.

I arranged for a draughtsman to go to Woolwich to measure up the original, which produced some very strange dimensions indeed and we then set about making a 'chinese copy' incorporating the 'improvements'. It never worked.

Jim Jeacocke

Nevertheless all these difficulties were eventually ironed out and many of these machines are still in current use as this picture of a modern Rotter machine shows.





DIAGRAMMATIC REPRESENTATION OF ROTTER IMPACT MACHINE

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