Meters, Patents and Expertise(s): Knowledge Networks in the Electric Meters Industry, 1880-1914

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OVERVIEW

1. Introduction

2. Shared Knowledge, Patents and the Making of the Industry

3. Infringements, Rights and the Making of Patents
   3.1 Authorship, Inventorship and Patent Agents
   3.2 ‘Hoist with his own petard’: Discovery vs Invention
   3.3 Scientific Authority and/or Legal Reasoning

4. Conclusion
Introduction

- Supplement or go beyond existing historiography
  - Business histories which focus on the business strategies, development and economics of manufacture (Wilson, 1987; 2000)
  - Histories of meters which focus on the role of users in the process of design (Gooday, 2004)

- IP as the entry point
  - IP strategies (corporations and individuals)
  - Management of expertise and authorities: Trust and Credibility topics of concern.

- Courts as ‘public theatres of contestation’: Dynamics, contingencies and the practical considerations in the legal procedures without neglecting the structures of jurisprudence and communication systems that had impact on the court cases.
Electricity meters industry: A heavily patented sector

Heterogeneity of inventorship:
- Practice oriented engineers- ‘manufacturing engineers’: Hookham, Ferranti etc.
- Scientist-engineers: Ayrton & Perry, Forbes, Hopkinson etc.
- Large Foreign Manufacturers (British Thomson Houston, Siemens, British Westinghouse)

IP management that promoted technology transfer from abroad: British Thomson Houston, British Westinghouse, Siemens

British Thomson Houston: After 1900 followed a hybrid IP management with technology transfer and investment in in-house inventing activities
Through the participation of practitioners like Ayrton and Perry – who bridged the academic and the industrial worlds – and the contributions of technologists like Ferranti or Hookham – who fashioned the roles of manufacturing engineers and professional inventors, the identity of electrical engineers was hybridised combining ‘science’ and ‘engineering’ either at the cognitive and epistemological or at the social and cultural level.

Through processes of *bricolage*, where social activities and models were merged and hybridized, electrical engineering was not only institutionalized but also socially legitimized as a scientific discipline.
Inventing and patenting canonical ‘scientific’ practices in the emergent ‘electrical science’.

Already patented meters were included in the articles in the technical journals of the period – the Electrician and the Electrical Review – the papers presented in institutions and associations like that of Electrical Engineers or in the Society of Arts.

These papers were considered as contributions to knowledge but they contributed mostly to the development of a literary genre, ‘analytical engineering’ (Pickstone, 2000): lacking thorough mathematical or experimental treatment of engineering phenomena.

IEE, ICE, IMechE, Society of Arts: forums of ‘patently shared knowledge’ rather than of collective invention
IP and Shared Knowledge in Public
Infringements, Rights and the Making of Patents
Authorship, Inventorship and Patent Agents

► Patent Agencies as loci where patent specifications were textually constructed. (Guagnini, 2002; 2009)

► The role of patent agencies as hubs of confidential information flows about inventions, technologies and experimental activities

► Large manufacturers established a relation of trust with their patent agents.
Marks and Clerk

► 1888 Marks and Clerk patent agency was established in Birmingham

► Founders: Dugald Clerk (later Sir) (1854-1932) with George Croydon Marks (later Baron) (1858-1938).

► 1910: Birmingham, Manchester, London and New York

► Customers: Hookham & Chamberlain (meters), Parsons Co. (turbines), Ferranti Ltd. (meters, generators, alternators, engines)
Marks and Clerk and the Ferranti Co.

- Inventors & patent agents: co-authors
- Information about Ferranti’s research activities
- Updates for possibly patentable devices
- Advice about possible infringements
- Patent agents: as drafters of specifications and expert witnesses
Discovery v Invention?: Managing expertise at the Bar

- Hookham & Chamberlain Co. v Johnson and Phillips Co. (1897)
- G. Hookham: electricity meters patent No 4225 of 1887, amended 1895
- William Ayrton & John Perry: motor meter patent No 2642 1882
- John Perry: Patent 1178 of 1880
A Good Lawyer matters more than a scientific theory and discovery

- Fletcher Moulton: The principles and the theory behind Hookham’s invention was known.

- Hookham meter was original in the sense that it was a synthesis of engineering practices and design techniques that nobody before had put together, providing a workable measuring device.

- Hookham and Chamberlain had the moral and legal right to pursue the monopolistic regimes provided by the patent law.
Ferranti Ltd v British Thomson Houston (1900)

Ferranti patent No 701 of January 1887, on the ‘Improvements of Electrical Meters’. The British Thomson Houston company was accused of importing from France and trading in Britain electric meters with the Ferranti innovation introduced in his 1887 patent.

Ferranti’s expert witnesses: Ferranti, Dugald Clerk and Wordingham

British Thomson Houston camp:
- Legal team: Fletcher Moulton
- Expert Witnesses: James Swinburne & James Alfred Ewing
Scientific Authority & Legal Reasoning

► Plaintiffs
- The plaintiffs’ strategy: Ferranti’s invention as definitive electrical contrivance that overcame existing practical problems with alternating current meters.
- Dugald Clerk: ‘There were many proposed, and the theory was quite well understood, but his was the only motor meter on the market’
- Wordigham: ‘Most Valuable’
- Wordigham in the witness box: ‘Q.1050. But you know of no meter prior to the date of the Plaintiff’s patent which was accurate at low loads? – No motor meter. Q.1051. And it was the introduction of this invention which made that practicable? – Yes.’

► Defendants
- Ferranti was not the ‘true and first inventor of the said alleged invention’
- There were relevant patents and publications by Brush, Siemens, Faure and Philips before Ferranti’s specification
- Incomplete specification: What exactly Ferranti aimed? What exactly did Ferranti meter measure?
Scientific Authority & Legal Reasoning

Charles Swinfen Eady, 1st Baron Swinfen
(31 July 1851-15 November 1919)

- Validity; Infringement; Classification

- Semantic Ambivalence:
  - What kind of meter? ‘Current’ or ‘Energy’ meter?
  - ‘Current to be measured’ in the Plaintiff’s specification means the lamp current which is made to pass through the additional coil. In other words it extends only to a current meter and does not include the case of an energy meter which measures and records the product of two variants the quantity and the potential, without measuring separately either variant’. (Judge Eady)
Conclusion

- The meters industry was dominated by the culture of patenting and the field was structured through patentable techniques and technologies and their management in the legal and market worlds.

- Inventors and patent agents: ‘co-authors’ of patents and intellectual property claims.

- No ‘open knowledge’ innovation pattern, but ‘patently shared knowledge’ innovation pattern. The domination of patents determined the industry as well as the making of the practitioners’ identities.

- The emergent type of scientist-engineer was compatible with the patterns of innovation through ‘propertization’ (Nowotny, 2005)

- ‘Scientification’ of industry: ‘science’ as socio-cultural category more dominant than ‘invention’ since 1890s

- Diversity/Heterogeneity of trust relations in authority: Practical expertise was represented as equally ‘authoritative’ with ‘scientific’ and ‘theoretical’ authorities.

- The networks of experts and expertise contributed in the formation and evolution of the industrial sector of the manufacture of electricity meters.
THANK YOU