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# Patents and the Formation of Technological Knowledge

## Owning and Describing Inventions in England and France (1780s-1850s)

*Pour une histoire des pratiques technologiques. Représenter l'invention en Angleterre et en France, XVIII^e^-XIX^e^ siècles : le cas des* patents/*brevets*

**Jérôme Baudry and Yohann Guffroy**

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# Patents and the Formation of Technological Knowledge

## Owning and Describing Inventions in England and France (1780s-1850s)

**Jérôme Baudry, Yohann Guffroy**

**Abstract**

This article examines how the English and French patent regimes contributed to the formation of technological knowledge in the eighteenth and nineteenth centuries. From the 1730s in England and the 1790s in France, patent requests were required to include a textual and often visual specification of the invention claimed by the applicant. We study the evolution of the specification genre, the chain of actors involved in the production of such documents, and the circulation of these texts and drawings in the public sphere of technology. To do so, we draw on a case study of six pairs of patents in the lace and tulle industry. By focusing on patents taken out in both countries for the same invention, we analyze how local cultures of invention and legal regimes shaped how technology was described. Tracing the history of Technology understood as the science of industrial arts requires, we argue, a deep dive into the archives of practice.

**Keywords**

patent, invention, patent agents, France, England, technological knowledge



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Jérôme Baudry, Yohann Guffroy

# *Les brevets et la formation du savoir technique*

## *Posséder et décrire l'invention en Angleterre et en France, 1780-1850*

**Résumé**

Cet article étudie la manière dont les régimes de brevets anglais et français ont contribué, aux XVIIIe et XIXe siècles, à la formation des savoirs techniques. Dès les années 1730 en Angleterre et les années 1790 en France, les demandes de brevet devaient contenir une description (textuelle et souvent visuelle) de l'invention, appelée « spécification ». Nous nous intéressons ici à l'évolution du genre de la spécification, au réseau d'acteurs impliqués dans la production de tels documents et à la circulation de ces textes et dessins dans l'espace public des techniques. Pour ce faire, nous nous appuyons sur une étude de cas portant sur six paires de brevets dans l'industrie de la dentelle et du tulle. En nous concentrant sur les brevets déposés dans les deux pays pour la même invention, nous nous mettons en mesure d'analyser comment les cultures locales de l'invention et les régimes juridiques ont façonné la manière de décrire les techniques. Retracer l'histoire de la Technologie en tant que science des arts industriels nécessite, selon nous, une enquête minutieuse dans les archives de la pratique.



**Mots-clés**

brevet, invention, agents de brevet, France, Angleterre, technologie

On 9 November 1816, at the Paris préfecture, Louis-Sébastien Lenormand (1757–1837), who described himself as a "professor of technology," filed his first ever patent application for "mechanical processes designed to facilitate and accelerate inland navigation." In France, Lenormand had long been involved in the development of Technology[1] understood as the science of the industrial arts through the articles he contributed to O'Reilly's periodical *Annales des arts et manufactures*, and he continued to do so a few years later with his own journal, the *Annales de l'industrie nationale et étrangère, ou Mercure technologique* (edited with Jean-Gabriel-Victor de Moléon), as well as the 22-volume *Dictionnaire technologique* (edited with Louis-Benjamin Francœur). However, quite vexingly for such a technological expert, the specification he filed was considered defective: the text was "insufficiently detailed," and the drawings were "not to scale and inaccurate,"[2] the French administration told him. Lenormand unwittingly discovered that a few paragraphs and a couple of freehand sketches were not enough to satisfy the disclosure requirement of the still relatively recent 1791 Patent Act. After submitting a better drafted specification, he finally received his patent. Over the next few years, Lenormand continued to interact with the patent system, taking out another patent, working as an expert in patent litigation,[3] and reviewing the publication of expired French patents in the *Revue encyclopédique*.



Patents provided crucial material for eighteenth- and nineteenth-century technologists who, like Lenormand, engaged in producing both scholarly discourses and popularized descriptions of the arts and manufactures. Since the 1730s in England[4] and 1791 in France, patent regimes on both sides of the Channel required the invention to be fully disclosed in

1. Following Mertens (2002), in this article we use "technology" to refer to "practices of instrumental operations" or to artifacts, and we use "Technology" (capital T) to refer to "reconstructions of technology, treatises on the arts, descriptions of technological operations, theories of the industrials arts, the science of technological transformation, etc." (p. 204).
2. INPI (Institut national de la propriété industrielle) Archives, Patent n° 1BA1008 filed on 9 November 1817, f. 16. Scans of French patents from 1791 to 1901 can be consulted here: https://archives.inpi.fr/brevets. All translations from French to English are by the authors.
3. See the 1821 case Laurens *v.* Lemare reported in Regnault, 1825, p. 335-343.
4. Until 1852, a patent application filed in London covered only England and Wales, requiring separate applications to be filed in Edinburgh for Scotland and Dublin for Ireland. From 1852 onwards, a single patent covered both Great-Britain and Ireland. For a study that also examines Scottish and Irish patents prior to 1852, see Bottomley, 2014b.

a public document called a specification. Paradoxically, through (temporary) appropriation understood as a "monopoly" in England and as a form of "property" in France, patents were tools for making knowledge public. Furthermore, the patent regimes in both countries can be considered technological endeavors in their own right, turning inventors into authors and technologists by forcing them to write down their inventions on paper. This process was quite a successful effort, resulting in 15,800 patent specifications in England between the 1730s and 1852 and 11,500 similar documents in France between 1791 and 1844.[5] Considering the many other institutional procedures that required practitioners to describe their inventions, such as the presentation of new machines and processes to academies and learned societies to obtain their endorsement or to compete for prizes, it is clear that Technology understood as a discourse on the arts was primarily a practical undertaking. The development of Technology was, to a large extent, driven by the activities of practitioners—artisans and artists, mechanics, manufacturers, engineers and others—whose textual and visual production fed the more intellectual ambitions of those who envisioned Technology as a new scholarly discipline. In this paper, we discuss patents as a privileged source for exploring the formation of Technology in the "archives of practice."[6] We study how inventors and their agents in eighteenth- and nineteenth-century England and France described their inventions through text and drawings, and we characterize the type of technological knowledge they produced and circulated through their patent specifications. We situate our research at the intersection of two branches of the historiography, hoping to contribute to both: first and foremost, the analysis of the construction, circulation, and standardization of technological knowledge in the early modern and modern periods;[7] and second, the exploration of the role of material and representational practices in the formation of intellectual property regimes from the eighteenth century to the present.[8]



5. The upper bound in each country is when a new act was passed.
6. Corcy, Douyère-Demeulenaere, Hilaire-Pérez (eds.), 2006; Hilaire-Pérez, 2013b, p. 44. Archives of practice are records generated during the work process, ranging from invoices and correspondence to notebooks and… patent specifications.
7. Vérin, 2007; Dubourg Glatigny, Vérin (eds.), 2008; Hilaire-Pérez, 2013a; Bertucci, 2017; Carnino, Hilaire-Pérez, Hoock (eds.), 2017; Baudry, Nègre (eds.), 2024.
8. See, among others, Pottage, Sherman, 2010; Rankin, 2011; Swanson, 2011; Arapostathis, Gooday, 2013; Biagioli, Buning, 2019; Baudry, 2023.

Although not yet the highly esoteric legal-technical hybrid they are today,[9] patent specifications in the eighteenth and nineteenth centuries were technological descriptions like no other. The specific function of patents—monopolizing a new machine or process—and the place of technical descriptions in complex patent practice, legislation, and jurisprudence gradually formatted patent specifications into a distinct genre. It is the formation of this genre, which inextricably mixes technological, legal, economic, and even moral considerations, that we attempt to trace here. To do so, and *contra* the tendency of the historiography to focus on national patent regimes, we examine both the English and French cases and, more importantly, the interactions between them through the transnational patenting strategies of inventors and manufacturers.[10] This approach better enables us to discern the factors that shaped the format of patent specifications. In the first part of the article, we provide a general overview of the process through which a specification was produced in England and France, detailing the chain of actors involved and the different styles—both textual and visual—of the specifications. The second part considers a case study of transnational patenting between the two countries, focusing on one sector: the lace and tulle industry. This focus is partly for reasons of convenience—notably the availability of archival sources—and because this was a rapidly mechanizing industry in the first decades of the nineteenth century, with several important inventions patented and mechanics circulating between England and France.[11] From within the lace and tulle industry, we selected 12 patents, forming six transnational pairs, in which a patent was first taken out in Country *A* and then transferred to Country *B* for the same invention.[12] This (laborious) selection process was achieved by manually comparing patent dates, titles, and applicants from databases of English and French patents. From the limited number of pairs we retrieved with a high degree of confidence, we eventually selected six that covered



9. Bowker, 1992; Myers, 1995.
10. For an econometric study of patenting by English inventors and manufacturers in France between 1791 and 1844, see Nuvolari, Tortorici, Vasta, 2023.
11. For an overview of this history, see Exposition universelle de 1851, 1857, p. 442-503, and Bensimon, 2023.
12. Patent titles were rarely literally translated when a patent for the same invention was taken out in another country. Legal restrictions placed on patenting abroad or importing patented inventions (which we do not detail here) meant inventors taking out foreign patents rarely did so in their own name, which also complicated our work.

a relatively wide time span, from the 1810s to the late 1840s. To add technological diversity to our analysis and check our conclusions were not entirely dependent on one particular industry, we also examined a few other Anglo-French patents from other industries.[13] We investigate how these Anglo-French patenting strategies affected the patent specifications and we reconstruct the networks of patent professionals who played a role in adapting—or not—texts and drawings to the local culture of invention and to the requirements of the law. Finally, in the third part, we examine whether, and how, in both countries, specifications traveled beyond the patent regime to inform broader technological knowledge. As we reveal, there was a gap between the public character of patents as envisioned by the law and jurisprudence through the disclosure requirement and the actual circulation of these documents in the public sphere of technology.

## Producing a patent specification in England and in France



### Navigating the administrative process

Between 1621 and 1852, applying for a patent in England was a very lengthy process. Inventors had to undertake 10 steps at different administrative bureaus, all in London at Chancery Lane, and had to pay a fee at each stage. The total cost was high—around £120 for protection in England, and triple that amount to extend it to Scotland and Ireland.[14] By way of comparison, Christine MacLeod highlights that the wage for a skilled worker in London was between one and two pounds a week.[15] Once sealed, the patent granted protection for 14 years. Until 1734, it was not necessary to file a full description of the invention, which made it difficult to determine whether a patent was encroaching on an existing one. This issue led the administration to decide that each new application had to contain an exhaustive and accurate explanation of the invention

13. We also studied the following pairs: 1) 6830 (EN) and 1BA5151 (FR) for engraving techniques; 2) 8683 (EN) and 1BA8933 (FR) in lithography; 3) 9498 (EN) and 1BA11526 (FR) for biscuits; 4) 1BB758 (FR) and 10578 (EN) in transportation; and 5) 1BB1885 (FR) and 11145 (EN) for roofs. We found no noticeable divergence.
14. See Bottomley, 2014a, Table 2.2, p. 74.
15. MacLeod *et al.*, 2003, p. 541.

that would allow a workman to reproduce it. The minimum requirement was a text, but drawings could also be filed; models or samples were never or rarely used. This system remained in place until the Patent Law Amendment Act of 1852, which profoundly changed patent practice and procedure. Consequently, even before a patent application was filed, its production could be expensive, depending on whether the applicant sought assistance with drafting the text and the drawings and the amount of work this required. According to engineer and patent agent John Farey, in his testimony to the parliamentary committee that investigated the patent regime in 1829, the expense ranged from £3 for a specification already well prepared by the applicant to £200 for a particularly complex invention. He estimated the average cost at £20 for the text and drawings, including duplicate drawings on parchment for the administration.[16] The process took about six months from filing the provisional specification to that of the complete version.

Compared with the labyrinthine administrative procedure that prevailed in England until the 1852 reform, filing a patent application in France after the 1791 Act was relatively simple. The inventor or their representative could file the specification or "mémoire descriptif," with the accompanying drawings, models, and samples, at the local préfecture of each département, which then forwarded the application to the central administration in Paris. Some inventors still traveled to Paris to conduct these formalities, partly because the clerical staff there was more used to handling such requests, but mainly because it was in Paris that the technological knowledge (in the form of books, collections of models, and experts) useful for preparing and refining the patent specification could be consulted. However, as in England, patenting an invention was rather costly, primarily due to the administrative fee, which had to be paid either in a lump sum or in two installments at the time of the application. The ability to choose a patent term of five, 10, or 15 years, instead of the uniform 14-year period in England, partially mitigated this financial barrier to patenting. A five-year patent cost 300 francs (compared with 800 francs for a 10-year patent and 1,500 francs for a 15-year patent), which still amounted to little less than the annual salary of a worker in a textile mill in northern France.[17] Statistical studies have found that patenting was



16. Great Britain, 1829, p. 17.
17. Lebrun, 1995.

socially skewed, with workers, artisans, and shopkeepers becoming ever less represented as the patent term increased, and industrialists, large merchants, and engineers concentrating on 15-year patents.[18]

Neither France nor England had established a system for examining patents before they were granted. Although proposals to establish a board of examiners were periodically made in the first half of the nineteenth century, they were never implemented. In England, until the 1852 reform, which drastically reduced the cost of taking out a patent from a £100 to a dozen, the fees acted as a barrier. During the 1829 parliamentary commission, engineer Samuel Clegg even argued for an increase in the fee, so only applicants with a true interest and who were certain of the profitability of their invention would apply for protection, thereby excluding "useless" inventions.[19] The only way for a patent to be thoroughly examined was through litigation.[20] It was only before a judge that the specification was examined in detail by the jury and by witnesses, often people from the trade, who were called upon to assess the clarity of the text. The minutes of patent trials reveal debates about technical concepts and the feasibility of inventions, as well as the intelligibility of the drawings, which counted as evidence in the same way as the text.[21]



In France, patents were also granted upon request, with no examination of the novelty or utility of the invention—leaving such examinations to the courts in the event of litigation. This feature of the French patent regime remained firmly entrenched throughout the long nineteenth century, in explicit contrast to the *Ancien Régime* privilege procedure, which subjected inventions to a thorough and material evaluation by the savants of the Royal Academy of Sciences and by the Bureau du commerce, a department of the central administration. Recent research has revealed, however, that despite this principled commitment to the "liberty" of inventors against the "tyranny" of examination, from 1798 until the 1844 patent reform, an expert committee comprising leading savants, engineers, and industrialists routinely performed an informal review of patent applications.[22] Although

18. Baudry, 2014, p. 81-90.
19. Great Britain, 1829, p. 95.
20. It was still possible to oppose a patent before the final filing deadline by submitting a caveat. In that case, the patent application was examined by the administration. See Bottomley, 2014b.
21. Arapostathis, Gooday, 2013; Guffroy, 2023.
22. Baudry, 2019b.

the Comité consultatif des arts et manufactures, as it was called, could not reject patent applications, it frequently informed inventors about prior knowledge and technologies that might invalidate their desired patent, asking them to reconsider their request. The Comité consultatif also ensured the specifications filed by inventors were sufficiently clear and exhaustive, and it insisted these documents conform to the norms of representation shared by its members. Thus, this institution proved influential in formatting and standardizing both the textual and visual language of invention in the patent specifications.

## Writing and drawing inventions

Despite the intervention of the Comité consultatif, the absence of formal administrative rules on how patent specifications should be drafted (only a text, which could be of any length, was required) meant inventors could choose their preferred style and techniques for describing and depicting their inventions. However, some clear patterns emerged over the years, with inventors embracing, in addition to texts, drawings as their preferred medium, as opposed to models and samples. Although from the beginning of the French patent regime, patent drawings were often analytical (i.e., presenting multiple views of the invention in plan, section, and elevation), they became increasingly schematic, moving away from the naturalistic genre that had initially prevailed. Color, shading, and perspective gradually gave way to geometric line drawings that insisted on the contours of the object rather than its intrinsic materiality. Between 1791 and 1814, about 60% of patent drawings were naturalistic and 40% were schematic; by the 1830s and early 1840s, these proportions had reversed to 30% and 70%, respectively.[23] Naturalistic drawings and more material modes of representation (through models or samples) did not disappear but were increasingly associated with a specific use of patents as a labeling and marketing tool that emphasized the supposed novelty and quality of some consumer goods. In contrast, analytical and schematic drawings were used to generalize and abstract inventions in more capital-intensive sectors (e.g., machinery) to advance maximalist property claims over them (see Table 1).



23. Baudry, 2023.

| **Capital intensity** | Capital-intensive sectors | Low-capital sectors |
|---|---|---|
| **Types of objects** | Means of production (machinery), technological systems (transportation) | Consumer goods (health, office supplies, luxury and novelty items) |
| **Type of specification text** | Complex texts | Simple texts |
| **Additional media of representation** | Analytical and schematic drawings | Models, samples, naturalistic drawings |
| **Mode of representation** | Representation as abstraction | Representation as reproduction |
| **Use of patents** | Patents as "intellectual" property | Patents as label or novelty/ quality signal |

**Table 1. – Patent uses and modes of representation in France: an ideal-typical model**



As in France, there were no specific rules in England regarding text length or drawing formats. However, from 1734 onward, English specifications began to become more standardized, typically including the applicant's information (name, address, occupation), a legal statement, and a description of the invention. A final section called "claims," specifying the scope of the invention, emerged in the early nineteenth century. Unlike in France, there was no shift from naturalistic to schematic representation; instead, both modes of representation coexisted, depending on what needed to be conveyed.[24] The development of schematic views coincided with the emergence of isometric perspective, pioneered by William Farish in the 1820s,[25] but these views never became dominant. Most drawings were analytical, but they remained naturalistic. However, throughout the nineteenth century, there was a clear professionalization of drawing practice, evidenced by the increasingly refined style, color use, and shading techniques, as illustrated in Figures 1 and 2. This improvement can be attributed to the growing involvement of patent agents in the preparation of specifications.

In England, experts had been advising inventors as early as the eighteenth century, albeit informally. For example, Samuel More, secretary of the London Society of Arts from 1769 to 1799, regularly assisted inventors in

24. The traditional historiography (Booker, 1963; Deforge, 1981) should be revised on this point.
25. Farish, 1822.

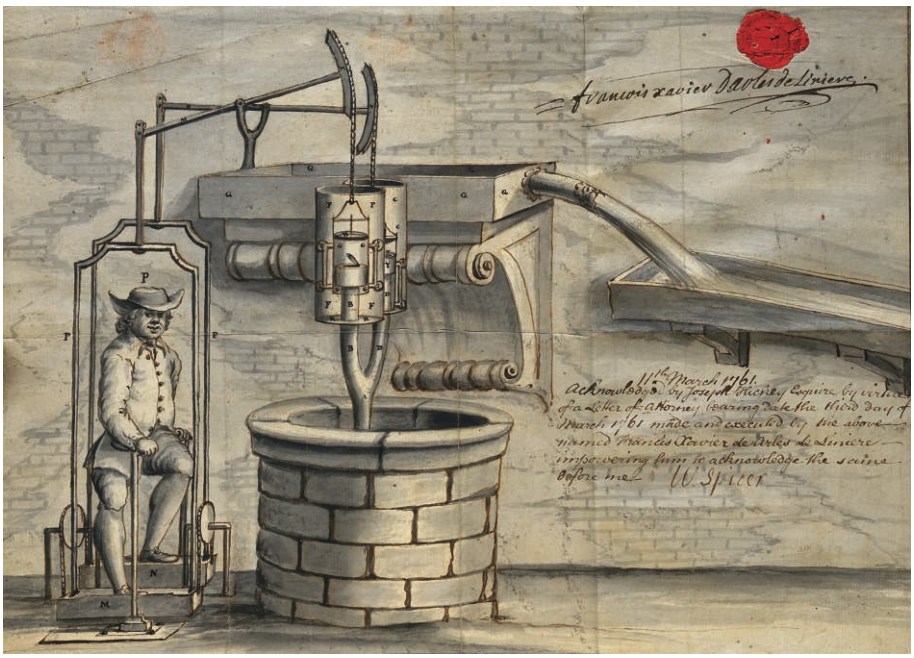

**Fig. 1. – Drawing from Patent nº 755, "A Pump of a new mechanism and construction…," filed by Francois-Xavier de Linière on 27 November 1760**





drafting their patent specifications.[26] It was not until the 1820s, however, that these advisers gradually formalized their activities into the profession of patent agents.[27] During the 1829 parliamentary commission, engineer John Farey identified himself as a patent agent serving applicants. His role was to help draft the description of the invention, produce the accompanying drawings, and file the application on his client's behalf. It is difficult to estimate the number of these professionals and the proportion of patent applications they handled during the first half of the nineteenth century. However, in addition to Farey, other well-known figures in the field included William Newton and his sons Alfred Vincent and William Edward, Newton's associate Miles Berry, and Moses Poole. To determine

26. James Harrison quotes Samuel More on this subject: "No man in the United Kingdom is so often consulted upon patents as I am who gets nothing by it" (Harrison, 2006, p. 1).
27. Dutton, 1984; Inkster, 2012. On patent agents and their professionalization in the US, see Swanson, 2009.

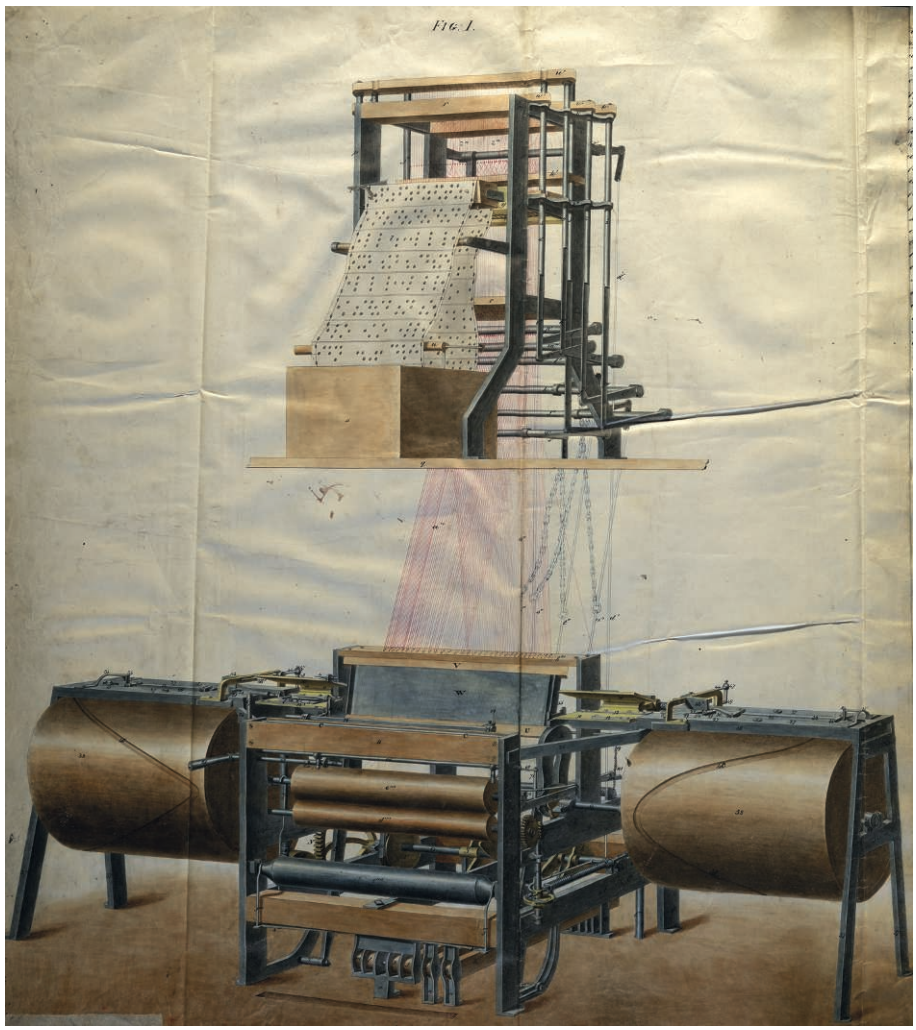




**Fig. 2. – Drawing from Patent n° 8725, "Improvements in Looms for Weaving," filed by Miles Berry on 27 November 1840**



whether a patent agent was involved in the patent application process, and in the absence of express records, the main evidence comes from the drawing sheets, which, unlike in France, were often signed by the agent rather than the inventor. These early agents usually worked within family structures. Farey employed his brother Joseph, his nephew, and even his

two sisters, Sophia and Ann, who, among other tasks, helped color the drawings produced by their brothers.[28]

In France, patent agents also played a role in the gradual standardization of the textual and visual languages of patent specifications. Agents acted as intermediaries with the administration, handled the application process, and, more importantly, helped inventors draft their specifications. Patent agents began to appear in the late 1810s, with Louis-Henri-Joseph Truffaut (who had previously worked in the administrative department that dealt with patent applications), Charles Albert,[29] Jean-Regnault Armonville (who also served as secretary of the Conservatoire des arts et métiers, the institution responsible for publishing expired patents), Antoine Perpigna, and, later, the brothers Jacques-Eugène and Charles-François Armengaud. By the early 1840s, more than 20% of the patents granted were handled by patent agents, and this proportion continued to rise throughout the nineteenth century.[30] Unsurprisingly, foreign inventors were the most likely to rely on patent agents, whose services enabled them to secure patents from abroad more easily. American and especially English inventors constituted a significant proportion of the international clientele of patent agents, partly because patent agencies had initially appeared in England in the last decades of the eighteenth century.



Since they handled a large number of specifications (including drawings), patent agents tended to adopt a homogeneous style for describing inventions. For example, Antoine Perpigna always followed the same structure for the specification or "mémoire descriptif": first, a short "Introduction" of usually one paragraph that stated the nature of the invention; second, a core technical description that guided the reader through the drawings and progressed from captions to a more complex narrative explaining the operation of the invention; finally, a concluding paragraph that delimited what was new in the invention and what the inventor claimed as their property.[31] This last section was clearly derived from the well-established English practice of ending the specifications with a series of "claims," which

28. Woolrich, 1997, note 7.
29. On Charles Albert, see Leuilliot, 1952.
30. Baudry, 2014, p. 297-302. For a study on patent agents in France in the late nineteenth and early twentieth centuries, see Galvez-Behar, 2006.
31. See, for example, Patent nº 1BA6422, filed by Antoine Perpigna on behalf of Manchesterian John Nicholson on 16 August 1837 for "improvements in spinning machines" (INPI Archives).

was probably familiar to French patent agents from their interactions with their English (and American) clients.

With this general context in mind, the next section considers a case study of Anglo-French patenting strategies in the lace and tulle industry, illustrating how inventors, intermediaries, and description practices shaped patent specifications in the nineteenth century.

## Transnational patenting between England and France: A case study

Although attempts to connect the different national patent regimes through international agreements only crystallized in the second half of the nineteenth century,[32] transnational patenting (i.e., patenting the same invention in different countries) was practiced long before. These industrial strategies provide interesting material for analyzing the effects of legal regimes and cultures of invention on the elaboration of patent specifications and of technological knowledge. In this section, we focus on a series of patents, some of which were first taken out in England and then in France, and some of which were first taken out in France and then in England, in the lace and tulle industry from the 1810s to the 1840s (see Table 2). We explore these patents to study closely the actors, description techniques, and legal implications of transferring protected inventions from one country to another.



### A network of actors and intermediaries

Table 2 illustrates that patent agents played a central role in transnational patenting, with Patents 2b, 5b, and 6b filed directly in the name of the agent (William Newton, Moses Poole, and William Edward Newton, respectively) rather than the inventor. Some patent files also reveal elaborate networks of patent experts at play. For instance, Samuel Hall's French patent (1b) was first handled by the London solicitors Archibald Rosser and his son, who passed the patent request on to Jean-Regnault Armonville in Paris. However, before Armonville filed the application at the local préfecture, Rosser, on the advice of engineer and patent agent John Farey,

32. Plasseraud, Savignon, 1983.

**Table 2. – Selection of English and French patents in the lace and tulle industry, 1810s–1840s**

As the patent term in these two countries ran from the date of filing by the applicant, we report filing dates rather than grant or issue dates.

| Direction of transfer | First patent | Second patent |
|---|---|---|
| *EN → FR* | Patents nº 4177 and 4178 filed by Samuel Hall on 3 November 1817 for a "Method of improving lace or net, or other fabrics with holes and interstices, made from thread or yarn, whether fabricated from vegetable, animal, or other substances" and for a "Method of improving thread or yarn as usually manufactured, of every description, whether fabricated from flax, cotton, wool, silk, or any other vegetable, animal, or other substance whatsoever" **(1a)**. | Patent nº 1BA1153 filed by Samuel Hall on 12 January 1818 for a "Process for perfecting yarn, either of linen, cotton, or silk, as well as for perfecting certain ornamental manufactures composed of yarns, such as laces and other kinds of reticular or open-mesh fabrics" **(1b)**. |
| *EN → FR* | Patents nº 5622 and 5741 filed by John Levers on 3 March 1828 and 18 December 1828 for "Machinery for the manufacture of bobbin net lace" and for "Improvements in machinery for making lace, commonly called bobbin-net" **(2a)**. | Patent nº 1BA3392 filed by William Newton on 5 September 1829 for "A new rotary device applied to machines called Levers Principle, suitable for making tulle, known as bobbin net lace" **(2b)**. |
| *EN → FR* | Patent nº 7638 filed by William Crofts on 10 May 1838 for "Improvements in the manufacture of lace" **(3a)**. | Patent nº 1BA7110 filed by James Fisher on 8 February 1839 for "Improvements added to looms for making brocaded and point d'esprit lace called bobbin net" **(3b)**. |
| *FR → EN* | Patent nº 1BA4229 filed by John Leavers[33] on 15 April 1833 for "Improvements to the cotton tulle machine known as the Leavers system" **(4a)**. | Patent nº 6423 filed by Louis Paul Lefort on 17 May 1833 for "Machinery for making bobbin net lace" **(4b)**. |
| *FR → EN* | Patent nº 1BA9287 filed by Louis Isaac and Michel Dognin on 17 May 1841 for "An embroidery machine à la Jacquard, called Isaac embroidery machine, applicable to all kinds of tulle bobbin looms" **(5a)**. | Patent nº 9133 filed by Moses Poole on 2 November 1841 for "Improvements in machinery used in the Manufacture of Bobbin net or twist lace" **(5b)**. |
| *FR → EN* | Patent nº 1BB8107 filed by Jourdan & Co. on 17 March 1849 for "Improvements applicable to looms used to manufacture plain and patterned tulles à la Jacquard" **(6a)**. | Patent nº 12572 filed by William Edward Newton on 16 April 1849 for "Improvements in machinery for the manufacture of net lace or other similar fabrics" **(6b)**. |

33. When he moved to France, John Levers (Patent 2a) informally changed his name to Leavers (4a) to make it easier to pronounce in his new country. See Bensimon, 2023, p. 209.

who had produced the original drawings for the English patent (1a), also consulted with Philippe Gengembre, a well-known chemist and engineer who worked at the Paris Mint. In the solicitors' own words, Gengembre was to "examine [the drawing]" and "see that everything was properly stated"[34] in the specification. It is not clear who eventually wrote the French specification, but the Rossers told Armonville they would be glad to "employ [him] on any business of the kind [they] may have in the future,"[35] suggesting this collaboration may have developed into a long-term partnership.

English and French patent agents appeared to work in tandem, with the inventor first contacting a local agent, who then forwarded the request to a preferred contact abroad. Such connections are relatively easy to trace in the French patent documents, which often mention agents and their postal addresses. For instance, in the case of Patents 2a and 2b, the French patent was nominally issued to English agent William Newton, but the documents indicate this was on behalf of the original patentee in England, John Levers. William Newton stated he resided in Paris with "le sieur Albert, rue Neuve Saint-Augustin, no. 28,"[36] revealing the patent agent Charles Albert filed the application. Similarly, French Patent 3b (issued to lace manufacturer James Fisher, although the inventor was his mechanic William Crofts) was filed by local agent Henri Truffaut, most likely through a connection with John Farey, who drafted and drew Crofts's many patents in England.



English patent documents are less detailed and mention only the name of the applicant, making it harder to reconstruct the chain of actors involved in the preparation of specifications. In the case of foreign inventors, at least until the 1852 reform, it was customary to file the patent in the name of the agent with no mention of the inventor, with the phrase "being a communication from a foreigner residing abroad" inserted after the title of the invention. Nonetheless, for cases 4, 5, and 6 (see Table 2) involving transnational patenting from France to England, we identified the main actors behind the patents. Once again, patent agents played a pivotal role, managing all three foreign patents: William Newton handled 4b, his son 6b, and Moses Poole 5b in collaboration with Antoine Perpigna for 5a.

34. Patent nº 1BA1142, filed by Samuel Hall on 12 January 1818, f. 6.
35. *Ibid*.
36. Patent nº 1BA3392, filed by William Newton on 5 September 1829, f. 1.

However, despite the pervasive presence of patent agents and the networked character of their activities, their practices were far from uniform.

## Reworking texts and drawings

Inventors and patent agents relied on a variety of literary and visual techniques to adapt the descriptions to a different culture of invention and legal regime. Sometimes, there was no adaptation at all; texts were translated verbatim, and drawings were copied using tracing paper. Transferring Patent 5a to England, patent agent Moses Poole filed an English translation of the original that followed the exact same structure. For instance:

*Ainsi qu'on le voit, le brodeur est une barre à pousseurs, pouvant au gré de la Jacquard, subir une foule de modifications différentes : il fonctionne par lui-même et sans intervention de la Jacquard, tant qu'il doit imprimer le mouvement aux mêmes bobines pour produire un même effet plusieurs fois répété.*[37]

Thus it will be seen, that the apparatus consists of a driving bar of pushers, which can, by the aid of the jacquard, produce a variety of different modifications; it can be worked without the aid of the jacquard in that degree that it should give movement to the same bobbins several times to produce the same effect.[38]



Apart from a few cuts that made the reworked specification a little more concise, the main difference is the name given to the invention. Although the French inventor had given his own name to the "brodeur Isaac," the English patent agent had to conceal the identity of the inventor for this "communication from abroad" and called the invention an "apparatus," a "machine," or, less succinctly, an "apparatus applied to a lace machine to produce ornamental work." The plates in 5b also faithfully reproduced the three schematic plates of 5a, with the French captions translated into English. In the case of 3b, patent agent Henri Truffaut even filed the tracing paper used to copy the original (colored) drawings, with the English captions crossed out and replaced by indicative letters (see Fig. 3a and 3b).

37. Patent nº 1BA9287, filed by Louis Isaac and Michel Dognin on 17 May 1841, f. 4.
38. Patent nº 9133, filed by Moses Poole on 2 November 1841, published version, p. 3.

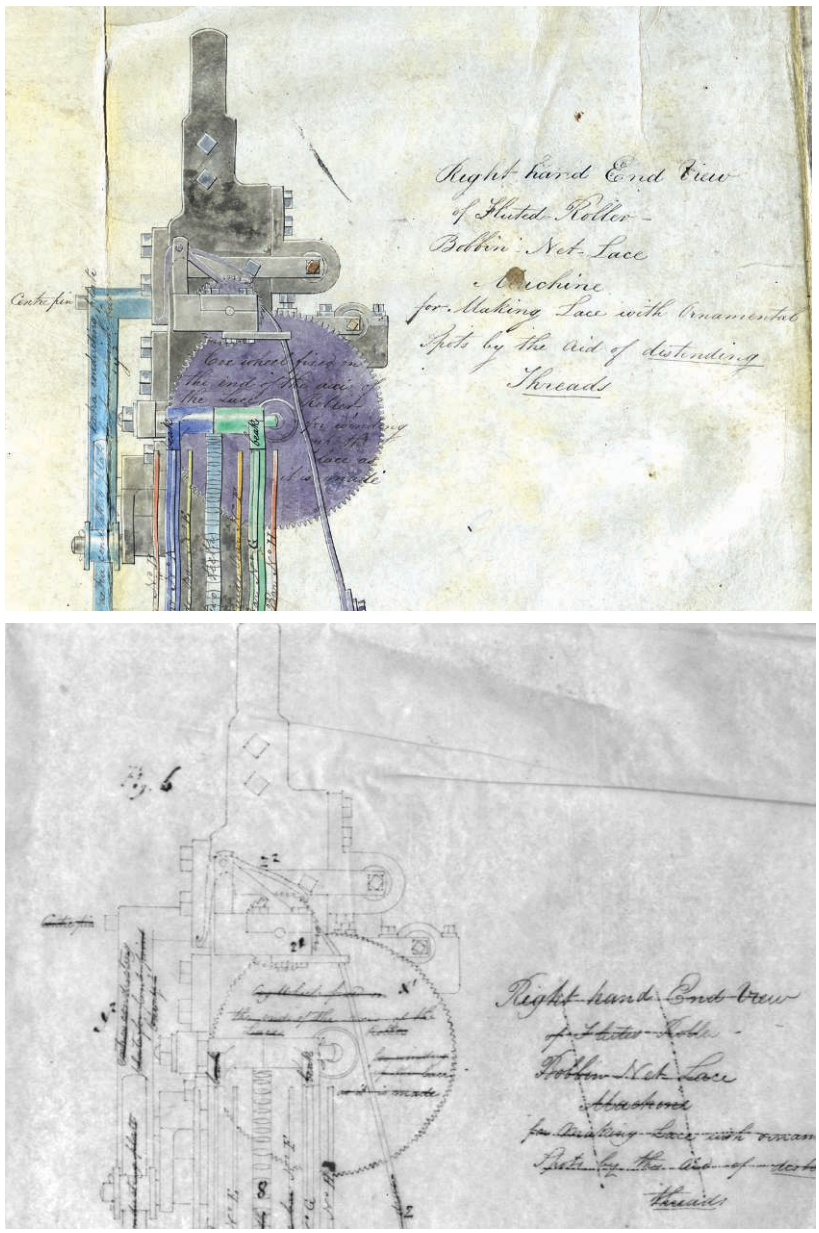




**Fig. 3a and 3b. – Detail of a drawing filed in Crofts's Patent 3a and Fisher's Patent 3b**

3a: English original, © The National Archives. 3b: Tracing paper in the French dossier, © INPI Archives.

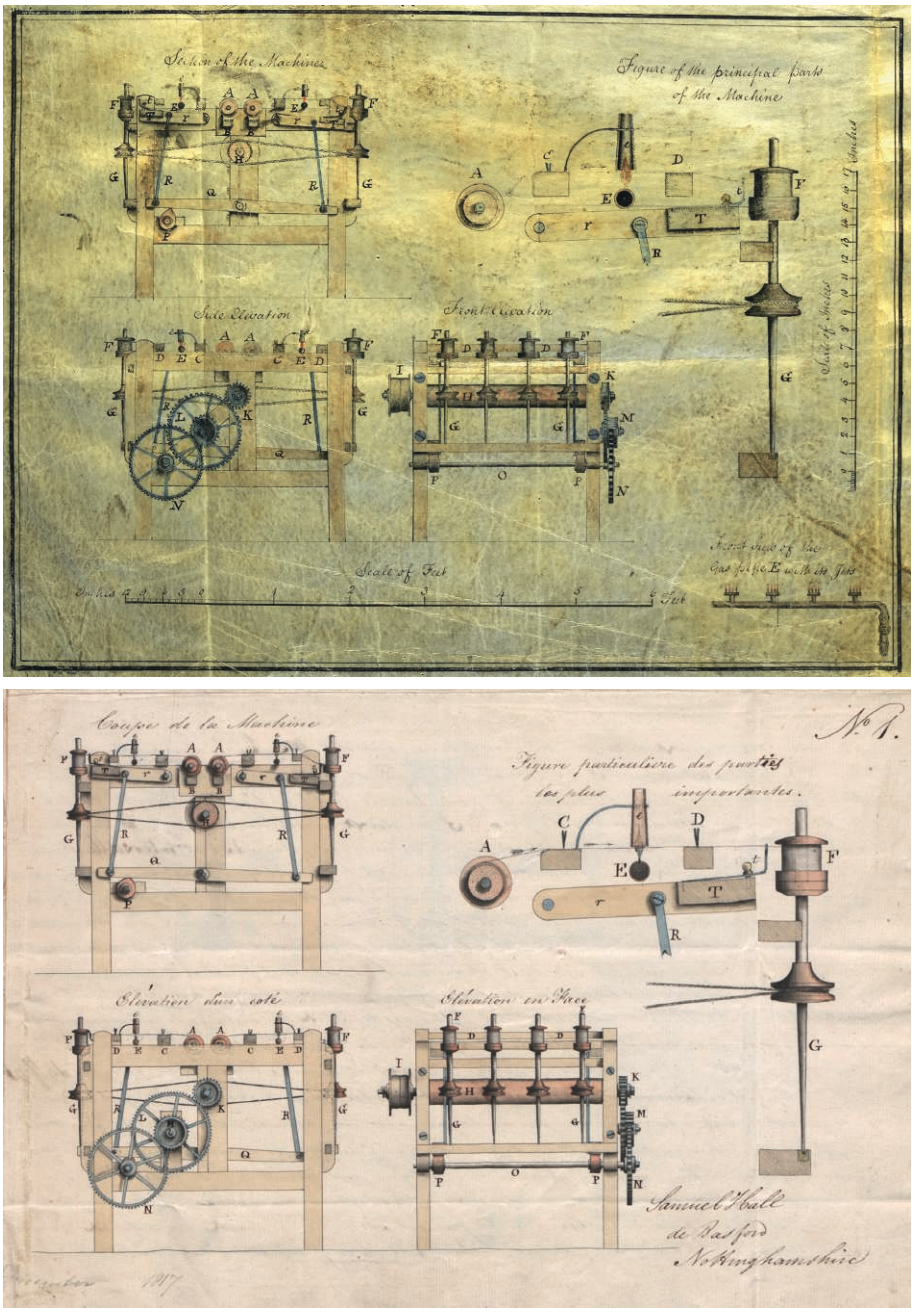


**Fig. 4a and 4b. – Two nearly identical plates in Hall's patents, 1a and 1b**

4a: English original, © The National Archives. 4b: French plate, © INPI Archives.

Compared to texts, patent drawings were more often reproduced as they moved from one country to another, sometimes with slight modifications. In the case of 1a and 1b, the French plate appears similar to the original, but one of the figures was omitted (in the lower right angle, illustrating the gas outlets), and the scale was removed (see Fig. 4a and 4b). Interestingly, it is only when the original drawings were not produced by a patent agent, whether English or French, that they were substantially reworked once transferred to the other country. Leavers's 1833 French patent (4a) contained four plates, two of which provided a full, naturalistic view of the loom with perspective and shading, whereas the other two were more schematic line drawings detailing the specific invention. It is unclear who prepared these drawings, but it may have been Leavers himself, as he was a highly skilled mechanic. In the corresponding English patent (4b) taken out by the manufacturer Lefort, the drawings bore little resemblance to the originals. Naturalism and perspective gave way to schematic sections and elevations that zoomed in on certain parts of the machine and employed color to emphasize the new elements (see Fig. 5). Since the drawings were



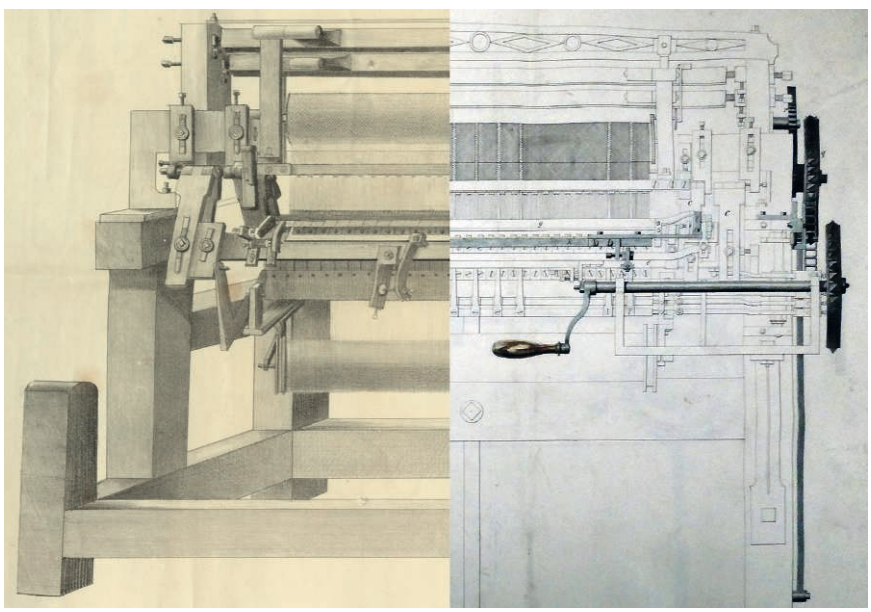

**Fig. 5. – Details of drawings from Leavers' Patent 4a (left) and Lefort's Patent 4b (right)**

overhauled, the text of the specification also differed markedly from the original.

The relationship between texts and images was another crucial feature of patent specifications: How was the dialogue between text and images articulated? Ultimately, which of the two media prevailed as the more reliable representative of the invention? From the close analysis of the 12 patent specifications listed in Table 1, it appears that two distinct modes of relation could be used. Both modes employed indicative letters that referred to elements of the machine (see Fig. 4a and 4b for an example), but the letters were integrated into the text differently. In the first mode of relationship, which we call the "list mode," the text of the specification functioned as an extended caption, with indicative letters used to describe the various parts of the machine analytically. This approach assigned precedence to the drawings, which formed the core of the specification. Patent 6a provides a good example of this mode:

> AA Plates of metal, or any other material, on which the warp threads are wound […].
>
> BB Combs or small strips of metal or cardboard, having a talon whose projection forms the space in which the AA plates are housed.
>
> C Wooden or metal box in which combs BB are stored.[39]



The list mode presented the object as a composition of elements, materializing the patentable invention as one of those elements or a combination of them. In the second mode of relationship, which we call the "narrative mode," the text used indicative letters to describe the interactions between the parts instead of detailing each of them sequentially. In this mode, the text became central to the description by animating the images and establishing the connections between the indicative letters. Patent 6b offers a typical illustration:

> when the plates *b* are arranged side by side in the box *c*, a narrow space or slit will be left between them at their upper parts, which are cut away or made thinner for this purpose, so as to receive the lower ends of the plates *a*, *a*. The wrap threads from the plates

39. Patent nº 1BB8107, filed by Jourdan & Co. on 17 March 1849, f. 5.

> *a* pass through holes made in the metal plate *d*, and after being wound three or four times round the regulating bobbins *e*, pass through another metal plate *g* to the upper part of the machine.[40]

The emphasis was on the general arrangement and action of the object, identifying the new invention not with one or a few discrete elements but with the entire machine through its mode of operation.[41] Of course, the distinction between the list and narrative modes should be considered ideal-typical; in practice, the contrast was often less pronounced, and the two modes could coexist in the same specification. Although it is difficult to draw general, clear-cut conclusions, even within a case study as limited as ours, English practitioners seem to have adopted the narrative mode more widely than the French. The decision to use the list mode or the narrative mode depended partly on the type of invention involved and partly on the legal-economic strategies of the patentees and the agents. However, differences in legal regimes—especially how they construed the patentable invention—were equally crucial and informed other stylistic choices.



## Techniques of the law

Describing and depicting inventions in patent specifications depended on local cultures of invention and technological conventions but was also strongly shaped by the law. Inventors, patent agents, and other practitioners did their best to adapt their techniques of description to what they perceived to be the requirements of the law, and through their work, the legal regime—not only patent laws and jurisprudence but also court practices and personnel—encoded the specifications.[42] For instance, while almost all specifications adhered to the same structure of an introduction, stating the nature, advantages, or novelty of the invention, followed by the technical description itself (whether in list or narrative mode, or both), English specifications almost always ended with a special section that encapsulated what the inventor claimed as distinctly new and, thus, as the property covered by the patent. In our case study (see Table 2), 2a was the only English patent that did not contain a claims section. The

40. Patent n° 12572, filed by William Edward Newton on 16 April 1849, published version, p. 3.
41. For a quantitative study of specification texts in France between 1791 and 1844, see Baudry, 2014, p. 408-411, p. 421-424.
42. Biagioli, Buning, 2019.

format of this section sometimes consisted of a short paragraph indicating the claimed invention was not intended to cover already known elements, but also that it was not limited to the particular machine described in the specification, such as in Hall's Patents 1a:

> In conclusion, I must observe that my Invention does not consist in any particular form or combination of machinery or apparatus by which the thread is drawn off from one bobbin and wound upon another, nor do I claim the exclusive use of any such machinery or apparatus; but my Invention consists in combining the use of the flame or fire produced by the combustion of inflammable gas with machinery, in such manner that the thread or yarn may be drawn through or over the flame or fire, so as to burn, singe, and destroy much of the superfluous fibre or fur as may be removed without injury the thread.[43]

The section could also take the form of a more elaborate list of claims that precisely distinguished between the various new elements of the invention. Crofts's Patent 3a listed seven claims:



> Having thus described the nature of my Invention, and the matter in which the same is to be performed, I would have it understood that I lay no claim to any of the parts separately or combined which have been before used and similarly applied, and some of the parts may be varied. But what I claim, is—
>
> First, the mode of constructing and applying guides and guide bars as herein described.
>
> Secondly, I claim the mode of producing the up and down motion of the point bars as herein described.[44]

Since English courts usually confined themselves to a strict and literal reading of the grant based on the specification alone, the claims section helped to ensure the patent protection was sufficiently broad. Precision was of the essence, as even small errors and inaccuracies could invalidate the patent.[45] French courts, on the other hand, tended to interpret the specification liberally, sometimes reconstructing the patented invention

43. Patent n° 4178, filed by Samuel Hall on 3 November 1818, published version, p. 5.
44. Patent n° 7638, filed by William Crofts on 10 May 1838, published version, p. 27-28.
45. Godson, 1823, p. 101-109; Perpigna, 1834, p. 9.

notwithstanding the patent's defects. This approach explains why only one (Patent 5a) of the six French patents in our case study contained a claims section. Although this paragraph was drafted by patent agent Antoine Perpigna, it was substantially revised by Moses Poole for the English patent (5b).

Another crucial effect of the law on the format of patent specifications derived from how different legal regimes considered the scope of an invention. In France, although the 1791 Act stated that patents could contain only "one main object, together with any secondary objects that may relate to it," both the administration and the courts tolerated complex patents covering more than one principal invention. This was not the case in England. In our case study, Hall (Patents 1a) was forced to split his initial English patent application into two distinct requests. However, when he transferred his patents to France, he regrouped them into one application. In their letter to the patent agent Armonville, the solicitors A. Rosser and his son, working for Hall, noted: "we believe the whole invention may be included in one Patent, though in England we have been obliged to have two separate patents."[46] As a result, French Patent 1b was drafted as a synthesis of the multiple originals, with parts of the text translated and rearranged in the specification, and the drawings were collated and reproduced almost identically. The same was true of Patent 2b, which combined two patents that Levers had taken out in England nine months apart. Descriptions of machines and processes in patent specifications were influenced not just by differences in material practices and conventions of technological knowledge but also, and crucially, by the law. This process resulted in a highly specific format that could be abstruse and inaccessible to "men of common understanding, with a moderate knowledge of the art" whom the law gradually construed and imagined as the main recipients of patent specifications—and even more so to the general public.[47] The next section examines the circulation of patent specifications beyond the patent system to determine the extent to which patents contributed to nineteenth-century technological culture.



46. Patent n° 1BA1142, filed by Sanuel Hall on 12 January 1818, f. 6.
47. Godson, 1823, p. 108.

## Publishing patent specifications

In both England and France in the early nineteenth century, patents were considered a contract or *quid pro quo* between the inventor and the public, with the public trading temporary protection in exchange for disclosure of the invention through the specification. The specification not only played an internal role in the patent system—by defining and mapping the appropriated invention for later use by the courts in the event of infringement or revocation—but also contributed to the broader mission of enlarging and circulating technological knowledge. At the time, however, neither country engaged in the immediate publication of new patents—this did not occur until 1876 in England and 1902 in France. The only official means of consulting existing (unexpired) patents was to inspect the originals in the rather inadequate premises of the central administration in London and Paris. This was a laborious and often costly procedure. In France, visitors had to pay 12 francs to obtain a specification, and before 1826 they could not even rely on an index to help them navigate the rapidly expanding maze of specifications. In England, also due to the lack of an index, the first step was to determine in which department (out of three) the patent had been filed—and each department had its own fee. Taking notes was not allowed, but copies could be obtained at a price based on word number; a copy of a long specification could cost up to £40—about a third of the cost of taking out a patent at the time.[48] All these barriers drastically limited the publicity of patent specifications.



In England, however, a few private journals played a crucial role in disseminating patent information and specifications. Although local newspapers, such as the *London Gazette*, the *Morning Chronicle*, or the *Nottingham Journal*, sometimes published a list of recently granted patents—usually providing only the date of the grant, the name of the inventor, and the title of the patent—a few technical periodicals reproduced the full or excerpted specifications of recent patents. In addition to direct communications from inventors and articles taken from the transactions of learned societies, such as the Society of Arts, *The Repertory of Arts and Manufactures* often published patent specifications during its existence between 1794 and 1862. The periodical also included specifications of foreign patents, as well as

48. See the testimony of clerk Francis Abbott in Great Britain, 1829, p. 60-65.

inventors' observations on their own patents. Another important outlet was *The London Journal of Arts and Sciences*, founded in 1820 by patent agent William Newton and lasting until 1866. As announced in the introductory notes of the first volume, this journal sometimes reworked the original specifications to make them more intelligible (and to save space): "We have steadily kept in view an early report of all New Patents, and a detail of their respective principles and properties, divested as much as possible of that technical language which too often precludes both perspicuity and common sense."[49] Other journals publishing patent specifications (often in abridged form) were the *Register of Arts and Sciences* (1824–1832), the *Inventors' Advocate* (1839–1841), and the *Artizan* (1843–1873).

These technical journals most likely obtained the material from the inventors themselves, who kept their original document after it had been copied and enrolled by the administration during the grant process. Such publications enabled inventors and their agents to make their new machine or process more widely known and to alert potential infringers to the existence of the patent. For example, Hall's 1818 patents (1a) were announced in *The Philosophical Magazine and Journal*, in *The New Monthly Magazine*, and in the daily newspaper *The Scots Magazine* (this list is very probably incomplete).[50] *The Repertory of Arts* also published one of the two patents (Patent n° 4177) verbatim, with an exact engraved reproduction of the plate (see Fig. 6).[51] Newton's *London Journal* faithfully reproduced the specifications of Levers (Patent 2a) and Lefort (Patent 4b) but only announced Crofts's patent (3a).[52] It is difficult to assess the readership of these technical periodicals, but we can surmise they constituted an archive of inventions that was useful not only to the insiders of the patent system—for instance, patent agents and lawyers could search these journals for prior publications during litigation—but also to those who engaged in technological education. Although we have no source to confirm this statement, the London Society of Arts or the later Mechanics Institutes might have held



49. *The London Journal of Arts and Sciences*, vol. 1, 1820, p. III.
50. Respectively, vol. 50, 1817, p. 467; vol. 8, 1817, p. 518; 1 January 1818.
51. *The Repertory of Arts and Manufactures*, vol. 33, ser. 2, 1818, p. 193-198 and pl. VII.
52. *The London Journal of Arts and Sciences*, vol. 4, ser. 2, 1830, p. 185-187 and pl. VIII; vol. 3, ser. 3, 1834, p. 291-297 and pl. XV; vol. 12, ser. 3, p. 189.

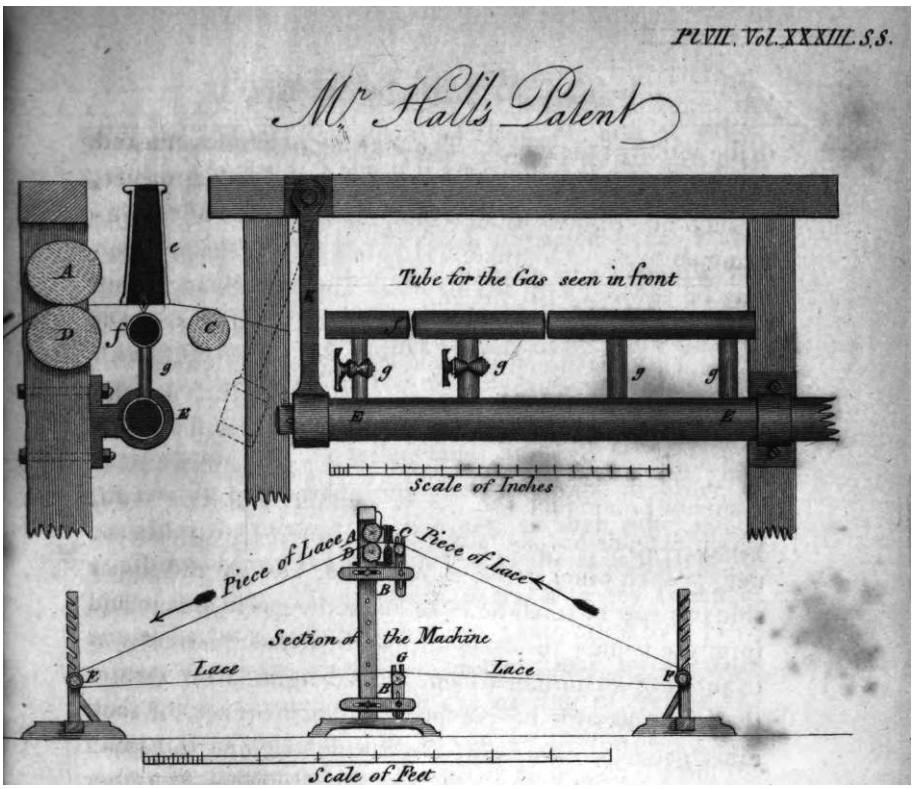


**Fig. 6. – Hall's patent drawing published in the Repertory of Arts and Manufactures, vol. 33, ser. 2, pl. VII, J. Wyatt, 1818**

Available online: https://babel.hathitrust.org/cgi/pt?id=uc1.a0004661922&seq=419&q1=.



these publications in their libraries. This was definitely the case in Paris at the Conservatoire des arts et métiers.[53]

In France, the 1791 Patent Act required that expired patents be published by the state, and in 1798, this task was entrusted to the Conservatoire des arts et métiers. This was a lengthy and costly enterprise that constantly lagged behind the pace of patent expiration, with the first volume of the dedicated *Description des machines et procédés spécifiés dans les brevets d'invention* published only in 1811. Only the first volume, produced under

53. *The Repertory of Arts and Manufactures* and the *London Journal of Arts and Sciences* are still in the Conservatoire's collection.

the supervision of the Conservatoire's first director, Claude-Pierre Molard, published the specifications verbatim and reproduced the drawings faithfully, even enriching the patents with notes and comments referring to similar inventions. Beginning with the second volume in 1818, realized under the direction of Gérard-Joseph Christian, the publication of the specifications was only partial, with some patents reproduced *in extenso* or in excerpts, and others (considered less important or even insignificant) mentioned only by their title. Moreover, the Conservatoire team reworked both the text and images of the specifications to make them more intelligible and to save space and streamline the series' production. While Molard wanted to collect descriptions of new machines and processes to offer the public a history of inventions, Christian aimed at normalizing technology through a common textual and visual language.[54]

Since Hall's patent (1b) covered an invention deemed important, it was published quickly, a year after its expiration in 1834.[55] The published version followed the same structure as the original—first, a few general paragraphs explaining the principle of the machine, and then a description of the plates through the list mode using captions—but introduced paragraphs that better separated the different sections. Almost all the sentences were rewritten to make them simpler and more direct. The title of the specification was changed, so it better announced what constituted the core of the invention, from "Process for perfecting yarn, either of linen, cotton, or silk, as well as for perfecting certain ornamental manufactures composed of yarns, such as laces and other kinds of reticular or open-mesh fabrics" to "Processes and machines for flaming linen, cotton, silk and foil yarns, as well as lace and other reticular and open-mesh fabrics, by means of the flame resulting from the combustion of hydrogen carbon gas." Finally, the original drawings (see Fig. 6) were also reworked into schematic line drawings without color or shading, which was the typical style favored by the Conservatoire des arts et métiers (see Fig. 7a, 7b and compare with Fig. 6).



Before the second half of the nineteenth century and the launch of technical periodicals by patent agents, such as the Armengaud brothers' *Le*

54. Baudry, 2019a.
55. *Description des machines et procédés spécifiés dans les brevets d'invention*, vol. 25, 1834, p. 71-75 and pl. 1.

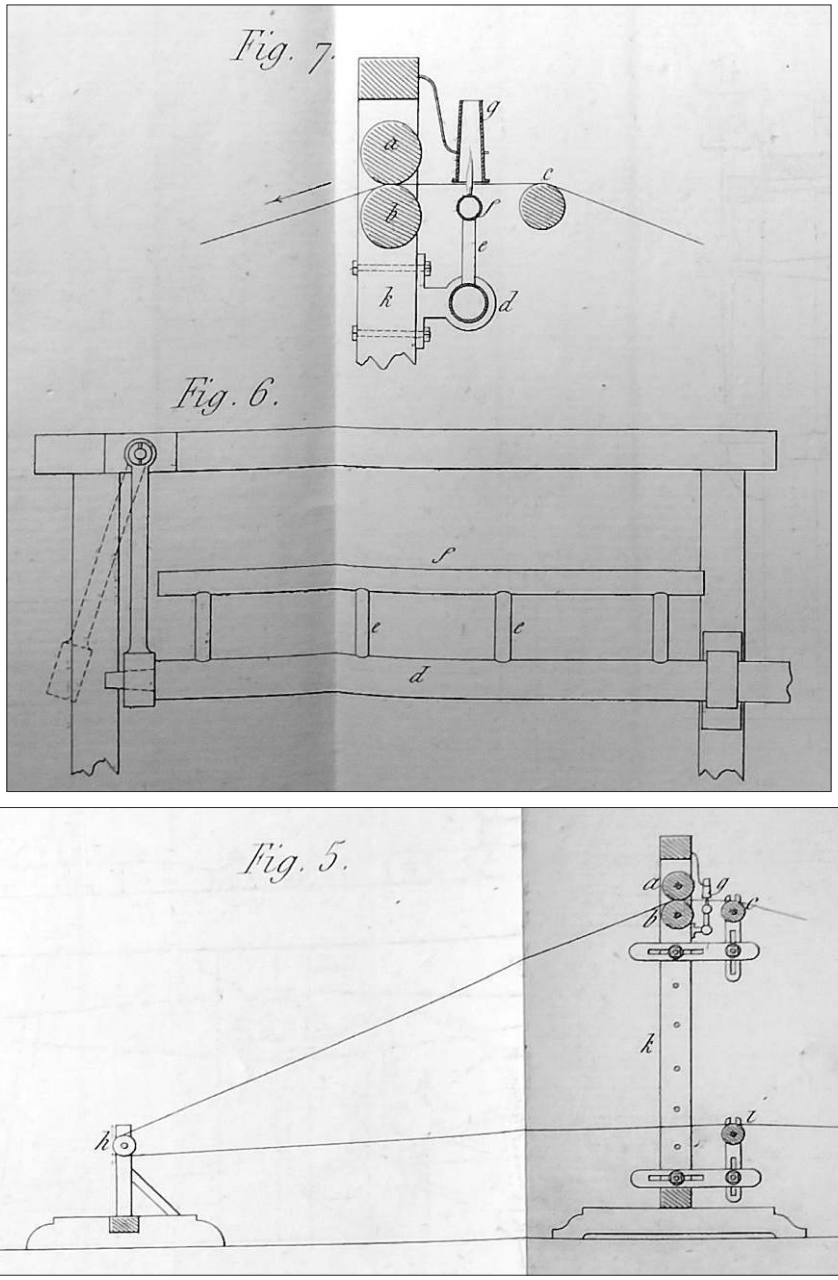


**Fig. 7a and 7b. – Hall's patent drawings published in the Description des machines et procédés, vol. 25, pl. 1, Paris, Chez Madame Huzard, 1834**

*Génie Industriel* in 1851, it was quite rare in France to find journals that published patent specifications, either *in extenso* or redrafted. Some journals published lists of recently granted patents, such as the *Annales de l'industrie nationale et étrangère ou Mercure technologique*, the *Gazette de l'administration de l'industrie et des beaux-arts*, and the *Archives des découvertes et inventions nouvelles* (in which Hall's patent was succinctly described).[56] The transactions of some learned societies, especially the *Bulletin de la Société d'encouragement pour l'industrie nationale*, sometimes contained more detailed descriptions.[57] This was the case for Hall's patent, which was published in the *Bulletin* only a few months after the French patent was granted.[58] However, it appears the source was not the French patent specification but the English patent or, more likely, its publication in the *Repertory of Arts and Manufactures*, with the French description in the *Bulletin* following the original English specification closely. The main difference was that the publication by the Société d'encouragement included a paragraph indicating the invention was not so new, since Molard (also a member of the Société d'encouragement) had built a similar machine a decade earlier.[59] When Levers' patent was published a few years later in the same *Bulletin*, this time it was clearly the French patent used as the source, since both its text and drawings were faithfully reproduced, and the engraving even indicated Newton was the drawings' author with the mention "Newton del."[60]



In both England and France, the partial publication of patent specifications limited and hampered the circulation of the technological knowledge they contained. Few patents enjoyed the privilege of full publication. According to Sean Bottomley, most patents in England appeared in at least one technical journal during the first half of the century, and there were periods (such as 1820–1833) when virtually all patents were published one way or another.[61] However, patent specifications were often shortened or summarized, and according to clerk Francis Abbot's testimony during the 1829

56. *Archives des découvertes et inventions nouvelles*, vol. 12, 1819, p. 381-383.
57. On the Société d'encouragement pour l'industrie nationale and its Bulletin, see Chassagne, 1989; Redondi, 1998; Blouin, 2024.
58. See the *Bulletin de la Société d'encouragement pour l'industrie nationale*, 17e année, 1818, p. 315-318 and pl. 164.
59. *Ibid.*, p. 317.
60. *Ibid.*, 29e année, 1830, p. 379-383 and pl. 445-447.
61. See Bottomley, 2014a, Figure 6.1, p. 191.

parliamentary commission, the "public journals" could not be trusted to follow a uniform and rational process and publish in full the important specifications: "I do not think the importance altogether regulates that," he declared, "it is a matter of convenience which the publisher considers; sometimes they want a long one because they have scarcity of matter, perhaps at other times a short is more convenient; and they frequently do not take those with drawings because they then save the expense of plates."[62] In France, after the 1818 volume of the *Description des machines et procédés*, only a curated selection of expired patents was published. In a review of the tenth volume of the series, technologist Louis-Sébastien Lenormand bitterly attacked the director of the Conservatoire for "substituting his will for that of the law," which had mandated the publication of all expired patents. Deploring such a limited publication, he noted that even "the worst machine always contains elements that can be used in a great number of circumstances," and that it was always useful to "feed… the genius of the artist" with the imperfect ideas and "unsuccessful work" of their "predecessors."[63] Some even considered the publication of expired patents as a worthless endeavor: "The progress of industry is so rapid that, when patents expire, there are hardly any still in use, and the public shows the most absolute indifference to the machines and processes published after the patents have expired," the manufacturer Théodore Barrois remarked.[64]



Although technical journals and publications helped to disseminate patent specifications—especially in England, where there were as many as 12 such periodicals in the 1850s[65]—in both countries the circulation of patent information and knowledge suffered from the lack of a dedicated administration. In England, this situation changed in 1852 with the creation of the Office of the Commissioners for Patents, which became the Patent Office in 1883 under the new Patents, Designs, and Trademarks Act. It was at this moment that the engineer and Superintendent of Specifications Bennet Woodcroft initiated the major campaign that resulted in the publication of all English patents from 1617 to 1852.[66] The Office staff also

62. Great Britain, 1829, p. 60.
63. Lenormand, 1826, p. 170.
64. *Recueil industriel, manufacturier, agricole et commercial*, 1830, p. 115.
65. Armengaud, Armengaud, 1851, p. 2.
66. Liffen, 2010; Guffroy, 2023, p. 72-79.

began to create systematic technological classifications to organize the ever-growing patent material, and started to produce indexes and published abridgments of specifications to help inform the public and facilitate the search for patent information.[67] Similar technological work was conducted privately in some of the large patent agency firms. These two worlds were in close contact, especially since it was not uncommon for Office staff and, later, examiners to join patent agency after a few years in the administration. In France, such developments did not occur until the turn of the nineteenth century, with the creation of the Office des brevets d'invention et des marques de fabrique in 1900 (renamed Office National de la Propriété Industrielle in 1902).[68] In addition to inventors and their agents, patent administrations constituted another "archive of practice" crucial for Technology as a scientific discourse.

## Conclusion



Even before the intervention of more developed patent administrations, patent specifications were already highly mediated documents in the first decades of the nineteenth century. Complex networks of intermediaries were involved in the various steps of the patent procedure, with patent agents playing a central role in the drafting of specifications and the transnational strategies of their clients. The informal examination of patent applications and the publication of expired patents in France, as well as the courts and their scrupulous reading of the patent documents in England, also crucially contributed to formatting the specification genre. Regular exchange and communication between the two countries produced some homogenizing effects, such as the gradual introduction of the "claims" section in French specifications or the diffusion of the narrative mode for describing machines, but overall difference and diversity prevailed. This point is true for texts and for drawings, which became standardized in England only through external factors in 1883, when the Patent Office imposed a specific format (schematic line drawings without shading or color except for occasional red lines) that eased the publication of patents. Furthermore, although the practice of concluding the specifications with

67. See *Patents of Invention. Abridgment of Specifications: class…*, 1855-1960. Some of them can be consulted online: https://tinyurl.com/2ajz6nud.
68. Dumas, 2003; Galvez-Behar, 2008, p. 182-189.

claims prospered, it was implemented in radically divergent ways in different countries, later leading a British patent agent to compare US claims to an Italian sonnet and British claims to the French *vers libre*![69] As historians Graeme Gooday and Steven Wilf recently argued, despite increased transnational patenting and international attempts to harmonize patent systems, differences in "patent cultures" remained—and remain to this day.[70] These differences were also embodied in the styles of patent specifications.

With a limited case study of 12 patents in the lace and tulle industry, this paper has only begun to explore the circulation of patent specifications and their role in the formation and systematization of technological knowledge in the eighteenth and nineteenth centuries. Larger-scale investigations should be undertaken, for instance, by tracking the presence of patent publications in the libraries of technological institutions and assessing their use in technical education, or through bibliographic analyses of important technological works, such as Andrew Ure's *Dictionary of Arts, Manufactures, and Mines*[71] in England or Lenormand's and Francœur's *Dictionnaire technologique* in France. Conversely, even more microhistorical studies than our own would be welcome, such as by dissecting the terminological choices made in translating a patent specification from one language to another—not an easy process, and one that led to some patent agents keeping the original or adding it between brackets after their proposed translation.[72] Finally, because the historiography of patents has largely focused on national patent systems, we need more studies that look beyond languages and state borders to assess the role of networks of actors and of the circulation of practices and knowledge in the shaping of both intellectual property and Technology as a discourse on the arts and, after the mid-nineteenth century, on industry.[73]



69. Potts, 1917. On claims and "claimology" in the US, see Pottage, Sherman, 2010, p. 127-152.
70. Gooday, Wilf (eds.), 2020.
71. Ure, 1839.
72. See, for instance, Patents 2b and 5a.
73. Carnino, 2010.

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