

## INDUSTRIAL ENGINEERING AND THE STRUGGLE FOR THE PROTECTION OF PATENTS IN GERMANY, 1856 – 1877

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The first Patents Act of the German Empire of 1871, which was passed in 1877, prompted Victor von Bojanowski, President of the Imperial Patent Office in 1890, to state: "German engineers and industry can congratulate themselves on this Act"<sup>1</sup>. In saying this, he was referring to the fact that even in 1871 nobody would have expected the recently founded German Empire to have enacted such a law. By contrast, in the years following its foundation German economists considered that patents, i.e. the protection of technical inventions, were detrimental to commerce and, therefore, to the German economy<sup>2</sup>. The passing of a Patents Act in 1877 was due to the fact that the Association of German Engineers (*Verein Deutscher Ingenieure*) had made an enormous effort to ensure equal protection of patents within German territory. A similar attempt was also made by the German Society for the Protection of Patents (*Deutscher Patent-Schutz-Verein*), which was absorbed by the Association in September 1874.

This struggle for a Patents Act helped the members of the new profession of "Civil Engineering" to become a coherent professional group with a common aim. In the struggle for patents, this group acquired for the first time a large profile.

In 1856, there was an entirely heterogeneous legal situation within the German territories<sup>3</sup>. The number of kingdoms, earldoms and free cities of the former Holy German Empire, loosely connected in an alliance (*Deutscher Bund*), varied between 1815 and 1871 for dynastic and diplomatic reasons; but it always exceeded 30<sup>4</sup>. All these territories had their own laws. There were some territories with a Patents Act, some without, some –such as Prussia, the largest state in the subsequent German Empire– with an ordinance concerning the protection of patents. This Prussian ordinance (*Publicandum*) of 1815 provided patents with poor protection. The applicant for a patent had to incur enormous costs for the publication of his patent drawings. In addition, he ran the risk of losing his invention within a short time, because the patents were granted in an arbitrary manner, lasting from a few months up to five years. In some years, about 75 to 80 % of all applications were

<sup>1</sup> BOJANOWSKI, Victor von (1890) *Ueber die Entwicklung des Deutschen Patentwesens in der Zeit von*

*1877 bis 1889*, Leipzig, Felix, 4.

<sup>2</sup> BEIER, Friedrich-Karl (1979) "Gewerbefreiheit und Patentschutz. Zur Entwicklung des Patentrechts im

19. Jahrhundert". In: COING, H. and WILHELM, W. (ed.) *Wissenschaft und Kodifikation des Privatrechts im 19. Jahrhundert*, vol. 4, Frankfurt am Main, Klostermann, 183–205, 199; also: TREUE, Wilhelm (1979) "Die Entwicklung des Patentwesens im 19. Jahrhundert in Preußen und im Deutschen Reich", *Ibid.*, 163 – 182.

<sup>3</sup> KECK, Otto (1993) "The National System for Technical Innovation in Germany". In: NELSON, R. (ed.),

*National innovation systems: a comparative analysis*, New York and Oxford, Oxford University Press, 115–157, 116.

<sup>4</sup> HAHN, Hans-Werner (1984) *Geschichte des Deutschen Zollvereins*, Göttingen, Vandenhoeck &

Ruprecht.

rejected.<sup>5</sup> The Prussian government even considered renouncing patent protection entirely. In a survey of the Prussian chambers of commerce in 1863 most of the chambers voted for the renunciation of patent protection.<sup>6</sup>

First, the arguments against patent protection were based on economic considerations. German economists rejected the protection of patents for the sake of free trade. They expressed the opinion that patents were detrimental to a flourishing economy given the special situation of German territory in the first decades of the 19<sup>th</sup> century. Prussian economists condemned the patents as a relict of the monopolies of the *Ancien Régime* before the liberal reforms, which were enacted after Prussia's defeat by Napoleon. This perception was not entirely without substance given that, at that time, patents were granted as royal privileges in Prussia, emulating the English *Statute of monopolies* of 1624.<sup>7</sup> England itself had enacted a formal Patent Act in 1852 in order to reform this model, which was based on Common Law.<sup>8</sup> In England, the patent system as a whole was the object of a royal commission ten years later.<sup>9</sup> Royalist Prussia rejected the French example.<sup>10</sup> In France, the revolutionary Patents Act of 1791 declared the protection of inventions to be a human right of the inventor<sup>11</sup>; the same thing was established in the so called "intellectual property clause" in section 8 of the American Constitution of 1787.<sup>12</sup>

But there was a second reason for the opposition to patents by leading economists in Germany. They saw patents as tariffs. A number of German territories had formed the Customs Union of 1834. This union, which was under the leadership of Prussia, sought to get rid of all tariffs within its territory. Patents have an effect similar to tariffs because they entitle their holder to hinder the import of goods, which are covered by his patent. Therefore, the territories within the Customs Union agreed upon a reciprocity clause for patent protection in 1842. Until the Enactment of the Patents Act in 1877, all subsequent efforts to create a uniform patent protection in the German territories had failed. With the exception of the unsuccessful revolutionary essay in 1848, when a Constitution was drafted declaring the

<sup>5</sup> HEGGEN, Alfred (1975) *Erfindungsschutz und Industrialisierung in Preußen 1793–1877*, Göttingen, 79.

<sup>6</sup> PREUBISCHE HANDELSVORSTÄNDE (1864) "Gutachten der preußischen Handelsvorstände über die Patentfrage". In: *Vierteljahrschrift für Volkswirtschaft und Culturgeschichte*, vol. 2, 193–215.  
<sup>7</sup> SILBERSTEIN, Marcel (1961) *Erfindungsschutz und merkantilistische Gewerbeprivilegien*, Zürich, Polygraphischer Verlag, 301.

<sup>8</sup> MANEGOLD, Karl-Heinz (1971) "Der Wiener Patentschutzkongreß von 1873. Seine Stellung und Bedeutung in der Geschichte des deutschen Patentwesens im 19. Jahrhundert", *Technikgeschichte*, vol. 38, 158–165, 159.

<sup>9</sup> MACHLUP, Fritz, and PENROSE, Edith (1950) "The Patent controversy in the Nineteenth Century", *The Journal of Economic History*, vol. 10, 1–29, 20.

<sup>10</sup> WADLE, Elmar (1999) "Entwicklungsschritte des Geistigen Eigentums in Frankreich und Deutschland.

Eine vergleichende Studie". In: SIEGRIST, H. and SUGARMAN, D. (ed.), *Eigentum im internationalen Vergleich, 18. – 20. Jahrhundert*, Göttingen, Vandenhoeck & Ruprecht, 245–263.

<sup>11</sup> KLOSTERMANN, R. (1876) *Die Patentgesetzgebung aller Länder nebst den Gesetzen über Musterschutz und Markenschutz*, second edition, Berlin, Guttentag, 323.

<sup>12</sup> KLOSTERMANN (1876), 306.

Protection of Patents to be a task of the planned Federation, the various administrations of the German territories lacked a united voice vis-à-vis the patent issue.

German Civil Engineers had founded their first professional organization in 1856. The Association of German Engineers was founded by former students of the Royal Prussian Industrial Institute (*Technische Gewerbschule*). This institute was a result of the reform of the Prussian technical education system in the early 19<sup>th</sup> century. It was founded as a technical school in 1821 in order to train Civil Engineers. Following the Prussian defeat at the hands of the French army, the leader of the Prussian Department of Commerce, Christian Beuth, attributed the military weakness of the country to the unsatisfactory technical skills of Prussian youth. Accordingly, Beuth founded the Technical School in Berlin to form a civil technical staff. Meanwhile, the young state engineers were obliged to attend the Prussian architectural academy (*Bauakademie*) of 1799. The technical school was renamed Industrial Institute (*Gewerbeinstitut*) in 1827 and subsequently, in 1847, the Royal Prussian Industrial academy (*Königliche Gewerbeakademie*)<sup>13</sup>, on account of the gradual academic alignment of its syllabus.<sup>14</sup> The Association of German Engineers was modelled on the English *Civil Engineers of the Kingdom*<sup>15</sup> of 1791. Among its aims was German unification, expressed in the word *German* (and not: Prussian) Engineers. It campaigned for unified measures in the German territories.<sup>16</sup> It also lobbied for the unification of German economic laws, among them, for instance, the patents law. During its annual meetings, the Association addressed the issues of standardization and legal unification in Germany, and the training of civil engineers. The Association grew rapidly from 23 founding members to 2000 within the following nine years. Most of the members were employed in the Prussian mining industry, in mechanical engineering or in technical chemistry.<sup>17</sup> While defending its interests, the Association gradually underwent a character change -from a society struggling for legal standardization it gradually developed into an organization fostering a awareness of a technical elite.<sup>18</sup> Soon after its foundation in 1861 the

<sup>13</sup> REIHLEN, Helmut (1992) *Christian Peter Wilhelm Beuth: Eine Betrachtung zur preußischen Politik der Gewerbeförderung in der ersten Hälfte des 19. Jahrhunderts und zu den Drakeschen Beuth-Reliefs*, Berlin and Köln, Beuth, 27.

<sup>14</sup> LUNDGREEN, Peter (1994) "Die Ausbildung von Ingenieuren an Fachhochschulen und Hochschulen in

Deutschland, 1770–1990". In: LUNDGREEN, P. and GRELON, A. (ed.) *Ingenieure in Deutschland, 1770 – 1990*, Frankfurt am Main and New York, Campus, 13-78, 27 passim.

<sup>15</sup> TREUE, Wilhelm (1984) *Wirtschafts- und Technikgeschichte Preussens*, Berlin and New York, de Gruyter, 505.

<sup>16</sup> KÖNIG, Wolfgang "Der Verein Deutscher Ingenieure und seine Berufspolitik, 1856 – 1930". In: LUNDGREEN and GRELON (1994), 304–315, 305.

<sup>17</sup> GISPEN, Kees (1989) *New Profession, Old Order*, Cambridge / Mass., Cambridge University Press, 43.

<sup>18</sup> BRAUN, Hans-Joachim (1986) "Technological Education and Technological Style in German Mechanical Engineering, 1850 - 1914", in: KRANZBERG, Melvin (ed.) *Technological Education–Technological Style*, San Francisco, San Francisco Press, 33–40; and KÖNIG, Wolfgang, "Science and Practice: Key Categories for the Professionalization of German Engineers", *Ibid.*, 41–47; also: DIENEL, Hans-Liudger (1998) "Zweckoptimismus und –pessimismus der Ingenieure um 1900". In: DIENEL, H: (ed.), *Der Optimismus der Ingenieure. Triumph der Technik in der Krise der Moderne um 1900*, Stuttgart, Steiner, 6–24; DIETZ, Burkhard, FESSNER, Michael, MAIER, Helmut (1996) "Der Kulturwert der Technik als Argument der

Society included patent protection on its agenda at its annual meetings, and as a goal for the following few years. Therefore, it covered the subject again in 1862 and 1863. Among the resolutions at the latter meeting was an agreement on the fundamental rules on which the desired Patents Act should be based<sup>19</sup>.

These efforts were futile. To make matters worse, the Congress of National Economists, the association of the leading German economists, passed a resolution in 1863 pledging the abolition of all patent protection<sup>20</sup>. To counteract these efforts, which were well received by the Prussian government, both the Technical Society for Ironwork (*Technischer Verein für Eisenhüttenwesen*)<sup>21</sup> and, subsequently, the Senate of Berlin's Merchants (*Berliner Kaufmannsältestenschaft*)<sup>22</sup> published papers on the need for patent protection. The first one was drafted by Werner Siemens, the inventor of the pointer telegraph and the dynamo. Siemens put so much vigour into the protection of patents that he could proudly report to his brothers that the subsequent Patent Act of 1877 was also known as the "*Charte Siemens*"<sup>23</sup>. Siemens was not a classic civil engineer. On the contrary, he had been educated as a state engineer in the Prussian artillery. He had left the army in 1849 to promote his inventions. Siemens had a bad experience of the Prussian Patent Office, the Technical Deputation (*Technische Deputation*), concerning his improvement of the galvanic gilding. Therefore, he did not take out patents in Prussia but in the United Kingdom, France, and the United States.<sup>24</sup>

At first, his paper was not well accepted. Moreover, the Prussian Chancellor Bismarck tried to influence the Northern German Federation (*Norddeutscher Bund*), the predecessor of the German Empire of 1871, to persuade its members to abandon patent protection<sup>25</sup>. The Federation had unsuccessfully been petitioned by the Association of German Engineers to pass a Patent Act in 1867<sup>26</sup>. Following the action of Bismarck, the Association of German Engineers protested again. Its Berlin Section petitioned the *Bundesrat* to guarantee the patent protection. This petition

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Technischen Intelligenz für sozialen Aufstieg und Anerkennung". In: DIETZ, B. et al. (ed.) *Technische Intelligenz und "Kulturfaktor Technik"*, Münster and New York, Waxmann, 1–32, 3; GISPEN (1989), passim.

<sup>19</sup> VEREIN DEUTSCHER INGENIEURE (1864) *Zur Patentfrage. Zwei Denkschriften nebst den Principien für*

*ein allgemeines deutsches Patentgesetz wie sie vom Verein Deutscher Ingenieure in seiner Hauptversammlung zu Braunschweig am 2.9.1863 aufgestellt wurden*, Berlin.

<sup>20</sup> NATIONAL-ZEITUNG, March, 18<sup>th</sup>, 1869.

<sup>21</sup> TECHNISCHER VEREIN FÜR EISENHÜTTENWESEN (1864) *Zur Patentfrage. Denkschrift des technischen*

*Vereins für Eisenhüttenwesen*. In: *Zeitschrift des Vereins deutscher Ingenieure*, vol. 8, 475–

502.

<sup>22</sup> SIEMENS, Werner (1869) "Denkschrift des Aeltestencollegiums der Berliner Kaufmannschaft an den

Königl. Preuss. Minister für Handel, Gewerbe und öffentliche Arbeiten". In: *Vierteljahrschrift*

für

*Volkswirtschaft und Culturgeschichte* 1864, vol. 1, 189–193; reprinted in: *Annalen des Norddeutschen Bundes und des Deutschen Zollvereins*, vol. 2, 42–52.

<sup>23</sup> Letter of Werner SIEMENS to his brothers in London, Berlin, April 28th, 1877, quotation from: MATSCHOW, Conrad (1916) *Werner Siemens. Ein kurzgefaßtes Lebensbild nebst Auswahl seiner Briefe*, Berlin, vol. 2, 520-521.

<sup>24</sup> FISCHER, Ludwig (1922) *Werner Siemens und der Schutz der Erfindungen*, Berlin, 14.

<sup>25</sup> BISMARCK, Otto von (1869) "Zur Reform der Patentgesetzgebung. Motivirter Antrag des Bundeskanzlers Grafen von Bismarck im Bundesrath des Norddeutschen Bundes". In:

*Annalen des*

*Norddeutschen Bundes und des Deutschen Zollvereins*, vol. 2, 33–42.

<sup>26</sup> HEGGEN (1975), 99.

followed Siemens' argument: Germany could no longer maintain its prosperity by copying foreign products. For this reason, it had to develop its own industrial standard. Therefore, it should improve the technical work, for instance by guaranteeing the protection of technical inventions<sup>27</sup>.

After the foundation of the German Empire in 1871, the need for patent protection was still not uniformly recognized. Therefore, the Association of German Engineers became active again. It addressed the "first chamber" of German legislation, the German *Bundesrat*<sup>28</sup>. Again this petition was drafted by Werner Siemens, repeating the statements of the former petition. This attempt was slightly more successful. A member of the "second chamber", the German *Reichstag*, introduced a bill concerning patent protection<sup>29</sup>. But this bill failed in the first chamber, the *Bundesrat*, which continued to be convinced of the harmful effects of patents. Mindful of this, Werner Siemens and Carl Pieper, a civil engineer, worked out a new strategy. Together with Heinrich Friedrich Wilhelm André, the mayor of Chemnitz<sup>30</sup>, and a number of civil engineers they founded the German Society for the Protection of Patents. The aim of this society was to unify the "respectable classes"<sup>31</sup> in order to influence German bureaucracy for a new parliamentary attempt. The Society soon counted many engineers among its members as well as jurists and some clerks<sup>32</sup>. The Association of German Engineers joined it as a group member in September 1874.<sup>33</sup> The Society for the Protection of Patents drafted two bills in 1874 (sent to the German *Bundesrat* on January, 22<sup>nd</sup>, 1875)<sup>34</sup> and 1876.<sup>35</sup> Meanwhile, it enforced its contacts with the German Administration<sup>36</sup>. The new leader of the German Chancellery gave his support to the Society in 1876<sup>37</sup>. The

<sup>27</sup> HEGGEN (1975), 105.

<sup>28</sup> VEREIN DEUTSCHER INGENIEURE (1872) "Petition des Vereines deutscher Ingenieure an den Bundesrath

des deutschen Reiches um Annahme des nachfolgenden Entwurfes zu einem Patentgesetz für das deutsche Reich." In: *Zeitschrift des Vereines deutscher Ingenieure*, vol. 16, 321-352. "Zur Patentgesetzgebung" (1873). In: *Annalen des Deutschen Reiches für Gesetzgebung, Verwaltung und Statistik*, 357-358.

<sup>30</sup> Naumann, Friedrich (1999) "Oberbürgermeister André, Werner von Siemens: Das Patentgesetz und die Stadt Chemnitz". In: BOCH, R. (ed.) *Patentschutz und Innovation in Geschichte und Gegenwart*, Frankfurt am Main, Lang, 1-6.

<sup>31</sup> Letter of Werner SIEMENS to Eugen LANGEN, February 16<sup>th</sup>, 1874, quotation from: MATSCHOW (1916), vol. 2, 439-441.

<sup>32</sup> The civil engineers tended to define themselves still as „factory owners“ and not as „civil engineers“ in the membership record of the Association. See: HEGGEN, Alfred (1973) "Die Bemühungen des ‚Vereines Deutscher Ingenieure um die Reform des Erfindungsschutzes im Vorfeld des Reichspatentgesetzes von 1877“, *Technikgeschichte*, 40, 337-444, 342.

<sup>33</sup> WEHR, Johann (1936) *Die Anfänge des Patentwesens in Deutschland*, München, 90, FN 31.

<sup>34</sup> DEUTSCHER PATENT-SCHUTZ-VEREIN (1875) *Entwurf eines Patentgesetzes für das Deutsche Reich nebst Motiven. Vorgelegt in einer Petition an den Bundesrath des Deutschen Reiches*, Berlin,

Kortkamp.

<sup>35</sup> DEUTSCHER PATENT-SCHUTZ-VEREIN (1876) *Revidirter Entwurf eines Patentgesetzes für das Deutsche Reich nebst Motiven. Dem Bundesrath vorgelegt durch den Deutschen Patentschutzverein*.

*Redigirt nach den Beschlüssen der Generalversammlung vom 15.11.1875*, Berlin, Kortkamp.

<sup>36</sup> HEß, Guido (1966) *Die Vorarbeiten zum Deutschen Patentgesetz vom 25. Mai 1877*, München, Schön 76.

<sup>37</sup> BOCH, Rudolf "Das Patentgesetz von 1877 -Entstehung und wirtschaftliche Bedeutung". In: BOCH,

German Chancellery installed a commission, which drafted a bill. It presented its first draft in 1876 to the public<sup>38</sup>. The Society for the Protection of Patents, namely Werner Siemens, published some complaints concerning this draft in 1876<sup>39</sup>. The Chancellery drafted a second bill addressing some of these complaints. It was approved in a slightly altered version<sup>40</sup> by the German parliament in May 1877. It was enacted on 1st July 1877<sup>41</sup>.

The success of this bill, which was partially based upon Siemens' papers of 1863, can be attributed to a number of factors. One of them was the economic crisis that took place between 1873 and 1876. Within this first small period of recession, the German public suddenly became aware of the fact that economic growth required an industry which could rely upon its own innovative potential, not only on the imitation of others. This had been just one of Siemens' theses since 1863. A second factor was the globalisation of industry during the industrial revolution. Maintaining an anti-patent position would have isolated Germany. The repeated offences against patented foreign products led the United States to announce their withdrawal from participating in the Universal Exhibition in Vienna in 1873. Because of this announcement, the first international congress on the protection of patents met during the Universal Exhibition of 1873. The initiative had come from the Chairman of the Universal Exhibition, the Viscount (*Freiherr*) of Schwarz-Senborn<sup>42</sup>. Members of the organizing committee were Carl Pieper as well as Werner Siemens and his brother William, who lived in London. Among the participants of this congress were lawyers, civil servants, company owners, as well as civil engineers from many different countries. The civil engineers were the largest group covering 23 %.<sup>43</sup> Soon the conference expanded to cover topics ranging from the protection of patented goods within international exhibitions to international protection of patents in a wider sense. An agreement was reached on the foundation of national societies for patent protection, among which the German Society for the Protection of Patents constituted the German section.

## Conclusions

First, it can be observed that the promoters of patents were mainly technical experts, whereas those who resisted patent protection belonged to the "old" intellectual elite, the economists. Second, it can be noticed that one of the most

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(1999), 71-84, 77.

<sup>38</sup> REICHSKANZLER-AMT (1876) "Entwurf eines Patentgesetzes", *Reichs-Anzeiger*, November 21<sup>st</sup>, 1876; also printed in: *Annalen des Deutschen Reiches*, 1877, 325-334.

<sup>39</sup> DEUTSCHER PATENTSCHUTZVEREIN (1877) "Zur Patent-Gesetzgebung. Bemerkungen des Deutschen

Patentschutzvereins zu dem Entwurf des Reichskanzler-Amtes". In: *Annalen des Deutschen Reiches*, 505-519.

<sup>40</sup> *Stenographische Berichte des über die Verhandlungen des Deutschen Reichstags* (1877), vol. I, 25-29;

see also: BUNDESRATHSAUSSCHUß FÜR HANDEL UND VERKEHR (1877) *Verlauf und Ergebnis der über die reichsgesetzliche Regelung des Patentwesens durch Beschluß des Bundesrathes veranlaßten Sachverständigen-Vernehmungen. Amtliche Protokolle*, Berlin, Heymanns.

<sup>41</sup> GERMAN FEDERAL PATENTS ACT (REICHS-PATENTGESETZ), May 25<sup>th</sup>, 1877. In: *Reichsgesetzblatt* 1877, 501.

<sup>42</sup> MANEGOLD (1971), 159.

<sup>43</sup> HEGGEN (1975), 113.

outstanding topics among the patent protectors was the promotion of technical work. I would conclude that the struggle for patent protection was a real as well as a symbolic struggle. The subtext was the positioning of the new profession of Civil Engineers, involving both their inner organization and their presentation to a general public. This new group campaigned for its recognition with "modern" measures: Lobbying as well as participation in non-governmental discussion about public welfare.<sup>44</sup> The group was well organized and acquired an international basis. All of these factors prepared them, in their opinion, to become a new "elite".

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<sup>44</sup> MACHLUP; PENROSE (1950), 5.