CAMBRIDGE

Cambridge University Press
052181135X - The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920
B. Zorina Khan
Excerpt
More information

1

Introduction

Institutions, Inventions, and Economic Growth

"We showed the results of pure democracy upon the industry of men."
– Edward Riddle, "Report on the World's Exposition," 1851

A belief in the ability of democracy and technology to enhance the common good has defined American society since the founding of the Republic.[1] To the men who gathered in Philadelphia to "promote the general Welfare," it was self-evident that ideas, inventions, and democratic values were integrally related.[2] The intellectual property clause was included in the very first Article of the U.S. Constitution, a document that distilled the precepts of a

[1] According to the *American Jurist* (vol. 10, 1833, p. 121), "no government of magnitude or power, whether free or arbitrary, has hitherto been sustained without the help of the distinction of classes." Democracy is a concept that is easily recognizable in its entirety but more contentious in the details, which can be as subtle as they are multifarious. This is not a treatise in political philosophy, so I will adopt the Alice in Wonderland approach, and merely specify a list of features that indicate what I mean by the term. Democracy entails the protection of private property, freedom of choice and speech, equality of opportunity, and equal access to political and economic institutions and their benefits (but not necessarily equality of outcome), an independent judiciary that protects the rule of law, an elected government that represents the majority of the population, a system of checks and balances to prevent subversion or capture by a self-interested minority, and flexible institutions that respond to changes in social costs and benefits.

[2] A common view in the eighteenth century held "That it is impossible for the arts and sciences to arise, at first, among any people unless that people enjoy the blessing of a free government. . . . The first growth, therefore, of the arts and sciences can never be expected in despotic governments." ["Of the Rise and Progress of the Arts and Sciences" Volume 2 of David Hume's *Essays, Moral and Political* (1742).] A letter of James Madison to Thomas Jefferson (New York Oct. 17, 1788) distinguished between the dangers of monopolies and exclusive rights in an oligarchic society and one based on democratic principles: "With regard to monopolies they are justly classed among the greatest nusances (sic) in Government. But is it clear that as encouragements to literary works and ingenious discoveries, they are not too valuable to be wholly renounced? Would it not suffice to reserve in all cases a right to the Public to abolish the privilege at a price to be specified in the grant of it? Is there not also infinitely less danger of this abuse in our Governments, than in most others? Monopolies are sacrifices of the many to the few. Where the power is in the few it is natural for them to sacrifice the many to their own partialities and corruptions. Where the power, as with us, is in the many not in the few, the danger can not be very great that the few will be thus favored." [http://www.constitution.org/jm/17881017_tj.txt, accessed January 2005.]

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
052181135X - The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920
B. Zorina Khan
Excerpt
More information

democratic society. The proposal passed without any debate and with unanimous approval, because it was viewed as a prerequisite for progress.[3] The growth of science and literature in tandem with broad-based access to an intellectual property system was even declared to be "essential to the preservation of a free Constitution."[4] Congress was therefore given the mandate to "promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[5]

One of the most striking innovations of the framers of the American Constitution was their recognition of the value of contributions from the less exceptional. American institutions were designed to ensure that rewards accrued to the deserving based on productivity rather than on the arbitrary basis of class, patronage, or privilege. Alexis de Tocqueville, still the shrewdest observer of the American national character, argued that "You may be sure that the more a nation is democratic, enlightened, and free, the greater will be the number of these interested promoters of scientific genius, and the more will discoveries immediately applicable to productive industry confer gain, fame, and even power on their authors. For in democracies the working class take a part in public affairs; and public honors as well as pecuniary remuneration may be awarded to those who deserve them."[6] The creators of supposedly heroic inventions were lauded in the European nations; inventors and innovators of all classes were universally celebrated in the United States. Indeed, according to Thomas Jefferson, "a smaller [invention], applicable to our daily concerns, is infinitely more valuable than the greatest which can be used only for great objects. For these interest the few alone, the former the many."[7]

[3] George Washington's First Annual speech to Congress on January 8, 1790 in Federal Hall, New York City, stated "The advancement of agriculture, commerce, and manufactures, by all proper means, will not, I trust, need recommendation; but I cannot forbear intimating to you the expediency of giving effectual encouragement as well to the introduction of new and useful inventions from abroad, as to the exertions of skill and genius in producing them at home. . . . Nor am I less persuaded, that you will agree with me in opinion, that there is nothing which can better deserve your patronage, than the promotion of science and literature. Knowledge is in every country the surest basis of publick [sic] happiness. In one, in which the measures of government receive their impressions so immediately from the sense of the community, as in ours, it is proportionably essential."

[4] "Literature and Science are essential to the preservation of a free Constitution: the measures of Government should, therefore, be calculated to strengthen the confidence that is due to that important truth," *U.S. Senate Journal*, 1st Cong. 8–10 (1790); *U.S. Annals of Congress*, 1st. Cong. 935–36; cited in Bruce W. Bugbee, p. 137, *Genesis of American Patent and Copyright Law*, Washington, D.C., Public Affairs Press (1967).

[5] U.S. Constitution, Art. I, § 8, cl. 8.

[6] Alexis de Tocqueville, *Democracy in America*, trans. by Henry Reeve (2 vols., London, 1889), II, 35–42.

[7] From a letter Jefferson sent to George Fleming in 1815, excerpt from *The Jeffersonian Cyclopedia*, http://etext.lib.virginia.edu.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
052181135X - The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920
B. Zorina Khan
Excerpt
More information

The belief in the power of technology and industry to serve the many was not unmixed, as we know from the conflicts between Thomas Jefferson and Alexander Hamilton. However, the early Jeffersonian fear of the negative consequences of monopolies and industrialization was soon lost in the optimistic conviction that democracy was a crucible that would convert the resources of man and nature into wealth for everyone in the nation, and not just an arbitrary few. American conceptions of Utopia, such as Edward Bellamy's *Looking Backward*, were colored by rosy visions in which technological innovations conjured up a benign world of plenty that allowed the attainment of the highest social and political ideals. Ultimately, the intellectual property system would have to incorporate the more complex idea that it was necessary to construct a system that induced patentees and copyright holders to contribute to social welfare, but at the same time did not create undue obstacles to the diffusion of their creations, nor to the development of new products that built on their pioneering contributions.[8] Nevertheless, the emphasis in the nineteenth century was decidedly on the need to promote progress through security of private property rights in inventions.

The American system of intellectual property was based on the conviction that individual effort was stimulated by higher expected returns. Abraham Lincoln – who was himself a patentee – declared that the rate and direction of inventive activity were determined by "the fuel of interest." Genius was redefined as the province of the many, not the rare gift of the few, and only wanted the assurance that the inventor would be able to benefit from his investments. Supreme Court Justice Joseph Story, whose brilliant decisions are enshrined in modern patent and copyright laws, exhorted an audience of ordinary mechanics in 1829: "Ask yourselves, what would be the result of one hundred thousand minds . . . urged on by the daily motives of interest, to acquire new skill, or invent new improvements."[9] The answer was not long in coming, for the next few decades would lay the foundation for American industrial and cultural supremacy. Contemporary observers were dazzled by the rate of cumulative attainments, and it is worth recalling that since the days of canal-building the optimistic notion of a "new era" has persisted throughout American history.[10] At first, the British were dismissive

[8] See, for instance, the testimonies before Congress when patentees applied for extensions to their existing patent term. As the editors of *Scientific American* noted, "Special acts of Congress in extending patents often do injury to inventors in general; they also tend to retard the progress of invention, and for this reason we oppose the extension of patents by Congress, in cases where patentees have been sufficiently remunerated. One patentee, under a democratic government like ours, has no more right to special privileges than another." *Scientific American*, January 21, vol. 9 (19), 1854, p. 149.

[9] Speech reported in *American Jurist and Law Magazine*, vol. 1 (1829).

[10] Writing at the start of the year of 1844, Commissioner Ellsworth marvelled that "The advancement of the arts, from year to year, taxes our credulity, and seems to presage the arrival of that period when human improvement must end." Report of the Commissioner of Patents for 1843, 28th Congress, 1st Session, [Senate] [150] February 13, 1844.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
052181135X - The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920
B. Zorina Khan
Excerpt
More information

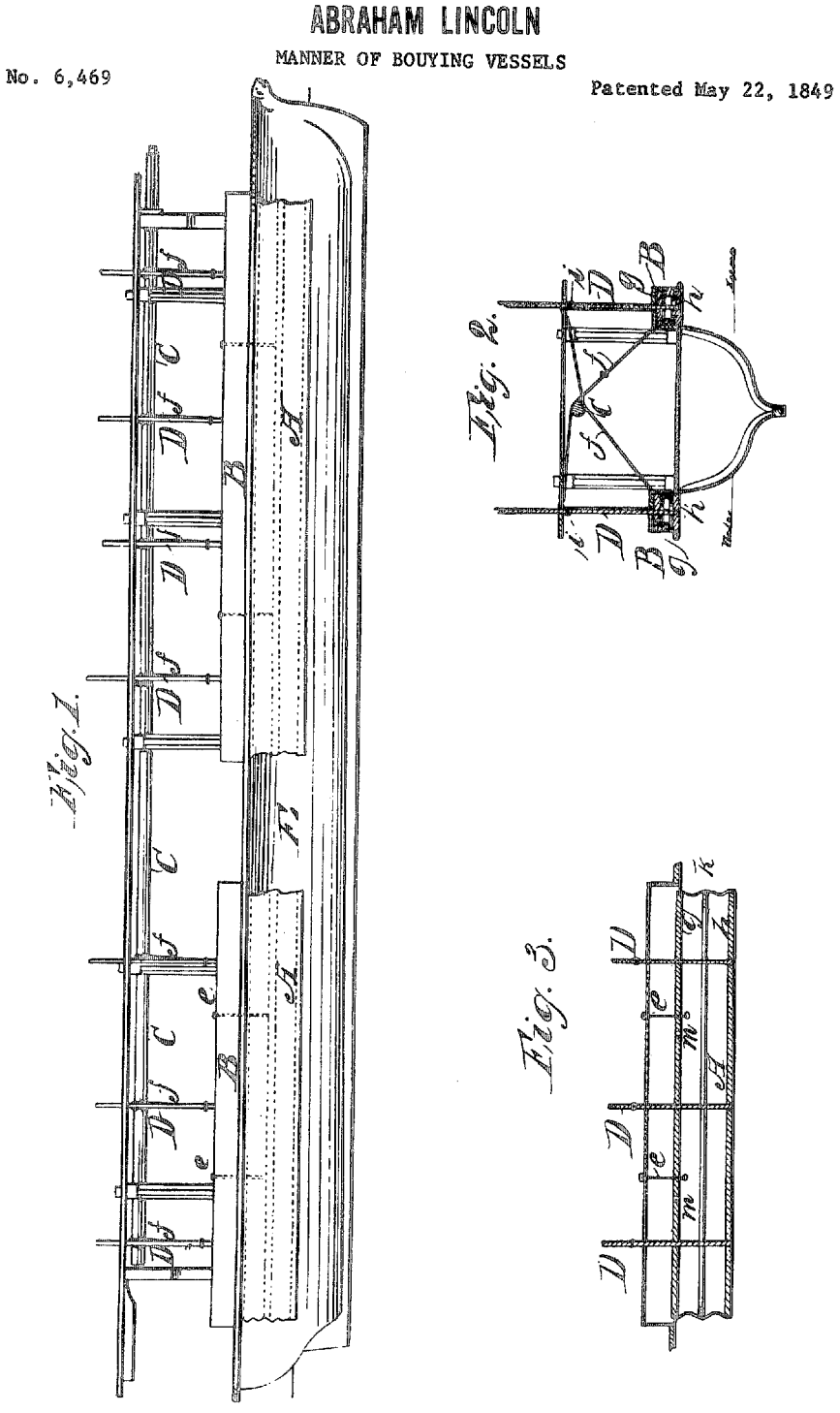

Illustration 2. Abraham Lincoln, the only President of the United States to obtain a patent, served as legal counsel in several disputes about patent rights. (*Source*: U.S. Patent Office.)

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
052181135X - The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920
B. Zorina Khan
Excerpt
More information

of American efforts, and even declared it was unlikely that their former colony would ever progress beyond facile emulation of superior European technologies and culture. However, by the time of the Crystal Palace Exhibition in 1851, Europeans were surprised and alarmed to find that the United States was marshaling its resources in a way that promised to propel it to the first rank among nations.

The United States today is the most powerful nation on earth but, as Stanley Engerman and Kenneth Sokoloff remind us, early in U.S. history its standard of living was lower than the level enjoyed by many of its contemporary South American and West Indian neighbors.[11] Even on the eve of the Declaration of Independence the United States was an undistinguished developing country with an agricultural economy and few pretensions to local cultural output of any distinction. How did this former colony make the transition from follower to a leading economy in the course of one century? Numerous contemporary observers tried to uncover the reasons for the rapid trajectory in American development, and many explicitly pointed to the advantages of a democratic society for technical and cultural inventiveness.[12] For others, the answer could be found in its intellectual property system. Attribution to any single factor will obviously overstate its influence, as American economic and social progress was a function of an array of variables, including (among others) a relatively equal distribution of income, an educated and enterprising populace, enlightened legal institutions, and favorable factor endowments. Nevertheless, the reinforcing relationships between intellectual property institutions and democracy in America are worth further exploration.

[11] Stanley L. Engerman and Kenneth L. Sokoloff, "Factor Endowments, Institutions and Differential Paths of Growth among New World Economies," in Stephen Haber (ed.), *How Latin America Fell Behind*, Palo Alto: Stanford University Press, 1997: 260–304; Kenneth L. Sokoloff and Stanley L. Engerman, "Institutions, Factor Endowments, and Paths of Development in the New World," *Journal of Economic Perspectives*, Vol. 14, No. 3, Summer 2000: 217–32

[12] For instance, see *The American System of Manufactures:* the report of the Committee on the Machinery of the United States 1855, and the special reports of George Wallis and Joseph Whitworth 1854, Nathan Rosenberg (ed.), pp. 388–89, Edinburgh: Edinburgh University Press, 1969. They noted the favorable attitudes of American workers toward new improvements, in marked contrast to the sullen disapproval of the British working class. The commentators tried to find the causes for their pervasive inventiveness and pointed to the beneficial influence of laws in the United States, and the widespread education and literacy that characterized ordinary citizens. An American observer of the Exhibition similarly declared that the items produced and displayed by the United States contingent provided "evidence of the ingenuity, industry and capacity of a free and educated people. . . . We demonstrated the progressiveness of the human mind when in enjoyment of liberty." Edward Riddle, "Report on the World's Exposition," Report of the Commissioner of Patents for the Year 1851, Washington, D.C., 1852: 347–485. This is also the source of the epigraph to this chapter.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
052181135X - The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920
B. Zorina Khan
Excerpt
More information

THE DEMOCRATIZATION OF INVENTION

This book examines American experience in a European mirror, and contrasts intellectual property institutions in Britain, France, and the United States. The philosophy and enforcement of intellectual property laws in Britain and France, the structure of the patent and copyright systems, and the resulting patterns of invention, were all consistent with the oligarchic nature of European society.[13] Although there is little consensus on many of these points, some have argued that early patent and copyright laws in England were conflated and tended to be explicated in terms of similar underlying principles of individual creativity and spontaneous manifestations of genius.[14] Later distinctions between patent and copyright doctrines were based on subjective estimations of the quantity and quality of mental labor involved in industrial and literary invention.[15] According to this mode of reasoning, literary and artistic inventions were more deserving of protection than pragmatic industrial inventions, and copyright piracy was regarded as a more egregious offence than patent infringement.[16] This perspective was reinforced by the grant of patents to anyone who paid the fees, regardless

[13] Modern scholars who specialize in the philosophical dimensions of intellectual property differ quite significantly in their interpretations of the implications of the nineteenth-century literature. It is not my intention to enter into this debate. The following discussion is necessarily quite general, and does not adequately document the subtleties in different perspectives, nor their changes over time. For instance, utilitarian arguments were sometimes made in Britain and France, and the appeal to natural rights were not entirely absent from American debates, at least at the rhetorical level. My outline draws on the preponderance of arguments in these jurisdictions to characterize the broad differences between U.S. and European approaches to intellectual property. However, the main emphasis here and in the following chapters is not on philosophical motivation but on policies and measurable outcomes.

[14] According to Mark Rose, in eighteenth-century Britain, "a work of literature belonged to an individual because it was, finally, an embodiment of that individual. . . . The basis of literary property, in other words, was not just labor but "personality," and this revealed itself in "originality." (*Authors and Owners: The Invention of Copyright*, Cambridge, Mass.: Harvard University Press, p. 114.) See also Martha Woodmansee, "The Genius and the Copyright: Economic and Legal Conditions for the Emergence of the 'Author'," *Eighteenth-Century Studies*, vol. 17 (4) 1984: 425–48.

[15] See Brad Sherman and Lloyd Bently, *The Making of Modern Intellectual Property Law: the British Experience, 1760–1911*, Cambridge: Cambridge University Press, 1999: "It is clear that during the literary property debate the quantity of mental labour which was embodied in representative objects played an important role in distinguishing between the different forms of protection then available" (p. 147) and "one of the defining features of intellectual property law in the eighteenth and the first half of the nineteenth century was its concern with mental labour and creativity" (p. 173). According to Clare Pettitt, *Patent Inventions – Intellectual Property and the Victorian Novel*, Oxford: Oxford University Press, 2004, initially the mental labor of mechanical and literary inventors was treated analogously, but "the analogy . . . between the inventor and the writer, was losing currency by the end of the century" (p. 32).

[16] See Brad Sherman and Lloyd Bently, *The Making of Modern Intellectual Property Law: the British Experience, 1760–1911*.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
052181135X - The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920
B. Zorina Khan
Excerpt
More information

of whether or not they were true inventors or mere importers of inventions. Although many Europeans in the nineteenth century lobbied to repeal patent protection, the same abolitionists would have been horrified at parallel proposals to turn all literary inventions over to the public domain.[17]

European societies were organized in ways that concentrated power in the hands of elites and facilitated rent-seeking by favored producers, and the organization of invention was no exception. The hierarchical culture of Britain and France was replicated through institutions that promoted the inherent rights and genius of authors and (to a lesser extent) inventors. Intellectual property systems were derived from the grant of "privileges" or monopoly rights from the Crown, and subsequent grants reflected their provenance. In British law, patents were regarded as "pernicious monopolies," which had to be narrowly interpreted, monitored, and restricted. The legal system was biased against patents in general, and incremental improvements in particular. High transaction and monetary costs, as well as the prevailing prejudices toward nonelites, combined to create barriers to entry that excluded the poor or disadvantaged from making contributions to economic growth. Patent fees in England were so costly that they effectively (and indeed, consciously) excluded working-class inventors from patenting their discoveries. As a result, trade secrecy likely played a more prominent part in protecting new discoveries, diffusion was certainly inhibited, potential inventors faced a great deal of uncertainty, markets were thin, and the rate of technological change may have been adversely influenced.

Clearly, despite these drawbacks Britain and France still experienced early industrialization and economic growth, but it is also true that their economies were unable to sustain their initial advantage. The case of patents and copyrights suggests that their loss of competitiveness may have partially owed to policies that favored elites and deprecated the contributions of the uneducated working class. The British system restricted patent rights in ways that favored capital-intensive industries and unbalanced economic growth patterns. The elite groups who were privileged by these institutions had little inducement to adopt improvements or techniques that infringed on their rents, and in some cases had the power to suppress competing technologies. As long as their private benefits were enhanced by such a strategy, they might even have had the incentive to shift the growth path onto a lower trajectory. As an example of this, the British patent system generated surplus revenues to patent agents and administrators who lobbied against reforms.

[17] Sherman and Bently point out that "while the anti-patent lobby believed that the producers of literary and artistic property . . . were properly designated as creators, the same could not be said of inventors," p. 150. They argue that the patent controversy of the 1860s and 1870s shifted the rationale for protection away from the labor theory of value and toward a characterization of patents as part of a utilitarian social contract between inventors and the state, with a focus on the invention itself.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
052181135X - The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920
B. Zorina Khan
Excerpt
More information

Recommendations such as the introduction of an examination system were rejected in part because they threatened to erode the Royal mandate. Moreover, since creativity and genius are unlikely to vary systematically over time, institutions that are predicated on these factors are unlikely to generate internal reforms that might induce greater inventive activity. Consequently, despite their inefficiencies, the patent rules and standards in both France and England remained essentially unchanged for stretches of over a hundred years. Similarly, the confused state of British copyright grants was rationalized only in 1911 and some have even argued that their present-day copyright laws remain "pre-modern."[18] In sum, England and France failed to offer inducements for investments by all potential inventors regardless of their background, and privileged the rights of elite producers in a manner that arguably reduced social welfare.

Instead of adhering to the European model, the United States consciously created patent and copyright institutions that were intended to function as the keystone of a democratic society. The Constitution specified that the pragmatic, utilitarian objective of the intellectual property system was to promote the public welfare through additions to knowledge and technology. Patent rights and copyrights were clearly distinguished in separate statutes in 1790, and developed along diametrically different lines based on a rational assessment of their costs and benefits. Policy makers in the United States were well aware of the European experience in this and other dimensions. They carefully considered the potential deficiencies of state grants of intellectual property rights, as well as suggestions for alternative strategies that others considered to be superior. They did not shrink from novel approaches that they estimated would increase social welfare, regardless of how great the popular outcry, as witnessed by their refusal to recognize international copyrights. Thus, it is implausible to consider the early structure of U.S. patent and copyright statutes and their implementation as haphazard or random; rather, the innovations in these institutions were deliberate, and comprised a critical part of a blueprint for a democratic society.

The discussion in this book highlights the contributions of intellectual property institutions in shaping the unique character of U.S. economic growth in the nineteenth century. Among the leading nations of the day it was commonplace to acknowledge that patent rights might increase the rate of invention, but it was less conventional to propose that the background or the identity of inventors was irrelevant to their productivity. Although the U.S. Constitution itself fell short of true democratic ideals in many regards,

[18] Sherman and Bently argue that, although patent laws gradually acquired their modern form in the second half of the nineteenth century, to some degree copyright laws in Britain still remain "pre-modern" (p. 192). According to Catherine Seville, "the rationale for copyright remains unclear" (*Literary Copyright Reform in Early Victorian England*, Cambridge: Cambridge University Press, 1999, p. 12).

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
052181135X - The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920
B. Zorina Khan
Excerpt
More information

the intellectual property system it authorized epitomized those ideals.[19] The patent system exemplified one of the most democratic institutions in early American society, offering secure property rights to true inventors, regardless of age, color, marital status, gender, or economic standing. The empirical analysis explores the extent to which outcomes accorded with these objectives. Who were the individuals contributing to the transformation of technology and society in the United States during this critical period, and what induced them to redirect their attention to creating additions to the existing stock of useful knowledge?

The patterns of patenting, when linked to biographical information, show that the expansion of markets and profit opportunities stimulated increases in inventive activity by attracting wider participation from relatively ordinary individuals. The technical skills and knowledge required for effective invention during this era were widely diffused among the general population. Rather than an elite that possessed rare technical skills or commanded large stocks of resources, the rise in patenting was associated with a democratic broadening of the ranks of patentees to include individuals, occupations, and geographic districts with little previous experience in invention. One finds among the roster of patentees not only engineers and machinists, but also candidates for the Greenback Party, schoolteachers, poets, humble factory workers, housewives, farmhands, teenagers, and even economists. *Scientific American* would later proclaim that the United States advanced "not because we are by nature more inventive than other men – every nationality becomes inventive the moment it comes under our laws – but because the poorest man here can patent his devices. . . . In the aggregate the little things – which in England or on the continent either could not be or would not be patented, owing to the excessive cost of the papers or other onerous conditions – probably add more to the wealth and wellbeing of the community, and more to the personal income of the inventor, than the great things do."[20]

The market orientation of the American intellectual property system aided the democratization of invention because it enhanced the opportunities of nonelite inventors. It is a standard libertarian claim that free markets evolve in tandem with democratic principles. However, the link between markets and democracy is often made in terms of consumer sovereignty or the freedom to choose among competing offers. The analysis here emphasizes the role that patents and copyrights played in the securitization of ideas through

[19] Robert Dahl points to seven undemocratic elements in the Framers' Constitution: slavery; limited suffrage; election of the president; the appointment of senators by state legislatures rather than by the people; equal representation in the Senate; judicial power; Congressional power to regulate and control the economy was constrained. (*How Democratic is the American Constitution?* New Haven, Conn.: Yale University Press [2001].) Because at least four of these elements can be disputed, it seems inevitable that the nature and extent of democracy in America will remain fuzzy and contentious to observers.

[20] *Scientific American*, October 21, 1876, vol. 35 (17), p. 256.

© Cambridge University Press www.cambridge.org

CAMBRIDGE

Cambridge University Press
052181135X - The Democratization of Invention: Patents and Copyrights in American Economic Development, 1790-1920
B. Zorina Khan
Excerpt
More information

the creation of tradeable assets: intellectual property rights facilitated market exchange, a process that assigned value, helped to mobilize capital, and improved the allocation of resources. Access to markets and trade in inventions led to greater specialization and division of labor among inventors, and furthered the diffusion of new technologies. Extensive markets in patent rights allowed inventors to extract returns from their activities through licensing and assigning or selling their rights. The ability to transform their human inventive capital into tradeable assets disproportionately helped inventors from disadvantaged backgrounds who lacked the financial resources or contacts that would have allowed them to extract returns by commercializing their inventions on their own.

American democracy, it is sometimes proposed, benefited men at the expense of women, and many women – especially those who lived in rural areas – were excluded from the mainstream of economic progress. Patents do not capture all of the inventions that are created, but this limitation makes it all the more striking that these records indicate that nineteenth-century women were active participants in the market for technology. The diffusion of household innovations in both rural and urban regions was more pervasive than previously thought. Patents by women comprised only a small fraction of total patents, but the overall patterns of patenting and the pursuit of profit opportunities by women inventors were similar to those of male inventors. A notable departure from the parallels between male and female patenting was manifested in the higher fraction of rural women who obtained patents, relative to the patterns for men. Women in frontier regions were especially inventive, and devised ingenious mechanisms to ease the burden of an arduous existence far from the conveniences of cities and extended social networks. However, even if patent rights were well protected by the federal courts, state laws also influenced the ability to benefit from innovations. The barriers to individual initiative that state legislatures initially placed in this and other contexts illustrates the wisdom of maintaining enforcement of intellectual property rights at the federal level. For much of the nineteenth century, married women lobbied for reforms in state laws that prohibited or hindered their capacity to hold property, engage in contracts, and keep their earnings. Legal reforms in married women's property rights encouraged women to increase their investments in patenting. Their responsiveness to such institutional changes highlight the importance of specific features of other institutions, including the parameters of intellectual property rules and standards.

According to Douglass North, "The most interesting challenge to the economic historian is to account for changes in the structure and enforcement of property rights over time."[21] One way in which to do so is through the

[21] Douglass C. North, p. 250, "A Framework for Analyzing the State in Economic History," *EEH* vol. 16 (3) 1979: 249–59.

© Cambridge University Press www.cambridge.org