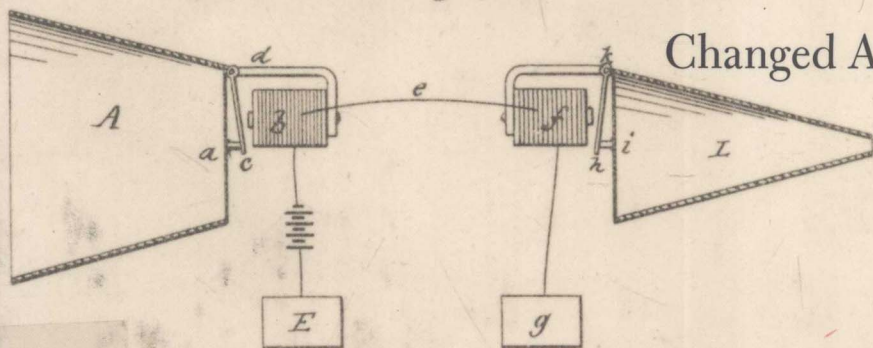


Invented by Law Alexander Graham Bell

and the Patent That

Changed America

Fig. 7



CHRISTOPHER BEAUCHAMP

Witnesses

W. L. Sick,
J. Hutchinson

Inventor:

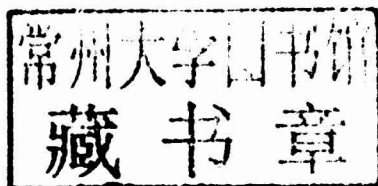
A. Graham Bell
by atty. Fuller & Smith

Invented by Law

Alexander Graham Bell
and the Patent That
Changed America



CHRISTOPHER
BEAUCHAMP



Harvard University Press

Cambridge, Massachusetts,
and London, England

2015

Copyright © 2015 by the President and Fellows of Harvard College

ALL RIGHTS RESERVED

Printed in the United States of America

First printing

Library of Congress Cataloging-in-Publication Data

Beauchamp, Christopher, 1977– author.

Invented by law: Alexander Graham Bell and the patent that changed America /
Christopher Beauchamp.

p. cm.

Includes bibliographical references and index.

ISBN 978-0-674-36806-4 (alk. paper)

1. Patent laws and legislation—United States—History. 2. Telecommunication—
Patents. 3. Bell, Alexander Graham, 1847–1922 4. Telecommunication—Law
and legislation—United States. 5. Patents—United States—History.
6. Inventors—United States—History. I. Title.

KF3116.B43 2014

346.7304'86—dc23

2014012680

INVENTED BY LAW

Contents

Introduction	1
1. Invention in the Lawyers' World	11
2. Acts of Invention	35
3. The Telephone Cases	58
4. The United States versus Bell	86
5. Atlantic Crossings	109
6. Patent the Earth	130
7. Patents, Firms, and Systems	162
8. Patents and the Networked Nation	185
Conclusion	205
<i>Notes</i>	215
<i>Acknowledgments</i>	261
<i>Index</i>	263

Introduction

ON APRIL 8, 1891, dignitaries assembled in Washington, D.C., to mark the hundredth anniversary of a landmark event: the passage of the United States' first patent law.¹ Three days of celebrations were planned, including banquets, receptions, a military parade at the White House, a grand Congress of Inventors and Manufacturers, and a six-hundred-person excursion on the luxury steamer *Excelsior* to Washington's tomb at Mount Vernon. At two o'clock on the first day, attendees gathered for the opening ceremonies at the Lincoln Music Hall, halfway between the White House and the Capitol. The hall thronged with senators, cabinet officials, lawyers, and inventors—"Many Men with Brains," as the *Washington Post* put it, although the newspaper was careful to attribute the brain power to the inventors in the audience rather than to the politicians on the dais.² The justices of the U.S. Supreme Court entered as a group, moving in black-robed formation behind the chief justice, to take seats on the stage amid a sustained ovation.³ Latecomers were still filing in when the president of the United States, Benjamin Harrison, mounted the stage to give the opening address. It had been, the president declared, "a great step in the progress of civilization when the law took notice of property in the fruit of the mind."⁴

After the applause had subsided, a series of speakers rose to tell the story of the patent laws and American invention. One after another, they paid homage to the great inventors and epoch-making technologies: James Watt and Richard Arkwright of England's Industrial Revolution, then Eli Whitney of cotton-gin renown, the steamboat pioneers James Rumsey and John Fitch, the rubber maker Charles Goodyear, and the telegraph inventor Samuel F. B. Morse.⁵ The barely unspoken message was that the heirs of these men sat in the audience. Reporters noted the presence of Richard Gatling, creator of the eponymous gun; George Westinghouse, the railroad engineer and electrical inventor; and Emile Berliner, of phonograph fame. Leading technologists of the railroad, telegraph, mining, and machining fields—all shining names of American industry in their time, even if unfamiliar today—rubbed shoulders with figures such as L. E. Waterman, the inventor of the fountain pen, and James L. Plimpton, the father of the modern roller skate.⁶

Another eminent figure, however, proved an “object of more interest in the audience.”⁷ The celebrity in question was Alexander Graham Bell. His own patent for the speaking telephone, then nearing the end of its seventeen-year term, was the most famous of its day—the reason why, in the words of one speaker, Bell's name was “literally ringing throughout the civilized world.”⁸ Among the celebrants of the patent system gathered in Washington, Professor Bell occupied a place of honor: he was one of the four vice presidents of the centenary event, a suitable position for the man who had “annihilated space and cuddled the cities of the Republic around a single fireside.”⁹

Outside the hall, though, away from the military bands and White House receptions that welcomed the second century of the American patent system, many would have given a darker account of Professor Bell and his patent rights. For years, Bell's claim to the telephone had been assailed in the courts and the press as illegitimate: founded on theft, bribery, and corruption, and propped up only by a “stout wall of fraud and ill-founded judicial decisions.”¹⁰ The U.S. government itself had launched a legal attack on the Bell patents, a remarkable and scandalous intervention that had dragged both the inventor and the administration into disrepute. Whatever good name Bell retained was inseparable from his corporate namesake, the American Bell Telephone Company, a na-

tionwide monopolist beset on all sides by rivals and enemies. Mere months after Bell received the accolades of the patent centennial, his own lawyer would wearily observe that “[t]he Bell company has had a monopoly more profitable and more controlling—and more generally hated—than any ever given by any patent.”¹¹

§

Today, Alexander Graham Bell’s invention of the telephone in 1876 is a touchstone of American history. More than any other single event, it serves as a standard example for teaching Americans about the nation’s inventive past. Bell routinely ranks among the one hundred “greatest” or “most influential” Americans, whether chosen by historians or by internet polls.¹² His cry of “Mr. Watson—come here—I want to see you,” although often misquoted, is one of history’s best-known exclamations.¹³ Academic and popular-science writers alike have used Bell’s telephone to explore the nature of invention.¹⁴ Business writers have looked to Bell’s discovery as the origin of a great communications industry.¹⁵ From the History Channel to the halls of academe, there is rarely such consensus about the significance of a technological breakthrough.

To this familiar episode, the chapters that follow bring a new perspective. This book is about law, and its central subject is not Bell’s invention, but his patent: the most valuable intellectual property of the nineteenth century and likely the most consequential patent ever granted. The history of Bell’s patent rights is, in part, the story of the bitter dispute about who invented the telephone—a famous saga of improbable claimants and scientific quarrelling. The tale of the telephone patents makes a satisfying narrative in its own right, featuring inventors and charlatans, capitalists and politicians, the rise of a business empire, a knife-edge decision at the Supreme Court, and a Gilded Age corruption scandal that reached to the highest levels of government and the judiciary. But it is also a story about how law shapes technology, the economy, and society. Above all, it is a story of patent law, one of the industrial world’s most opaque and quietly powerful branches of jurisprudence.

In a sense, the role of law in the history of invention is a problem hiding in plain sight. To any observer of the gaudy 1891 patent centennial, it would have been clear that the patent system was both a prime concern

of American industry and a prominent institution of the national government. But even apart from such celebrations, the law kept pressing to the forefront. Patent battles engulfed many of the major technologies of America's industrial age, from the telegraph and electric light to the automobile and the airplane. The historian Daniel Boorstin, surveying these struggles, once observed that "[t]he importance of any new technique in transforming American life could roughly be measured by the quantity of lawyerly energies which it called forth."¹⁶ Historians have not, however, succeeded in explaining why this was so.

This book seeks to illuminate the hidden workings of the patent law in several ways. First, it explains how Alexander Graham Bell came to be anointed the inventor of the telephone through the courts, and why that mattered for the technology that he helped to pioneer. In doing so, it reconstructs the world of nineteenth-century patent law and litigation, seeking both to understand how the law worked and to restore its place in American legal history more generally. At the same time, the story of the telephone patents offers insights into a particular technological and economic moment: the "second industrial revolution" of the late nineteenth and early twentieth centuries. Finally, the view is extended across the Atlantic to place Bell's patent in an international frame. Each of these approaches individually challenges previous historical assumptions. Together, they make an argument that patent law—so often dismissed as an arcane and impenetrable niche of legal practice—has played an active and controversial role in the course of American history.

Placing law at the forefront transforms how we look at the long-contested question of who invented the telephone. Scores of biographies celebrate Bell as the inventor of the device. Conversely, a long line of books question Bell's priority of invention and champion the claims of his rivals. The debunking tradition has flourished in recent years, notably in A. Edward Evenson's closely argued book *The Telephone Patent Conspiracy of 1876* and Seth Shulman's widely noticed *The Telephone Gambit: Chasing Alexander Graham Bell's Secret*.¹⁷

The popular and scholarly literature about who "really" invented the telephone misses a broader point: that the question itself is a legal artifact. Why, after all, do we still pursue the inventor of the telephone, as opposed to, say, the inventor of the refrigerator or the television? The

reason lies in the early patent battles. “Who invented the telephone?” first became a famous question in the 1880s, thanks to the high-stakes and much-publicized litigation that swirled around the technology. Beginning just a few years after Bell’s successful telephone experiments in 1876, the Bell Company’s attorneys fought a string of cases that sought to bring the entire field of telephone technology under his legal control. Their campaign met with fierce resistance, much of it directed toward disproving Bell’s worthiness and advancing the priority of others. On both sides, publicity was a weapon: the glorification of Alexander Graham Bell began as an imperative of litigation; likewise, the promotion of counterclaimants was a necessity for those seeking to challenge the Bell patent monopoly.

More fundamentally, “Who invented the telephone?” was a question defined by law. Legal rules shaped not only the standards of proof but also the terms of inquiry: defining what it *meant* to be a first and true inventor and prescribing the ways that a would-be great inventor needed to describe his achievements in order to gain a patent of maximum breadth. Within these parameters, lawyers prepared the contending positions, marshalled evidence, and argued publicly and bitterly over the origins and nature of the technology.

The lawyers have exerted a powerful grip on historical memory. Today we may take for granted that the telephone originated with a single man, that it consisted essentially of a single invention, and that it represented a sharp technological break with the prior art. But for Bell and his legal representatives these were bold arguments, deliberately and consciously made in pursuit of a patent that would control the telephone business. In the courts of the day, and in the judgment of posterity, those arguments succeeded in spectacular fashion. In that sense, it was the lawyers, as much as anyone else, who invented the telephone.

§

What makes this story matter beyond the telephone case is the window it gives us into the law of the age. The Bell litigation was one of the largest courtroom conflicts of any kind during the nineteenth century. Yet one would hardly know it from reading a standard legal history of the period. This omission is all the more striking since, for decades, one of

the central concerns of American legal historians has been to explore the economic effects of the law and the role played by legal institutions in economic development.¹⁸ Patent law involves issues that should be central to these debates. Still, one can search in vain for a discussion of patent law in the classic works on law's relationship to the economy.¹⁹ Patent law has been eclipsed, not only by the great issues of constitution-making, war, race, and slavery, but even by less romantic matters such as insurance and accident law, the law of watercourses, bankruptcy, and regulation.

It is not hard to guess why. Patent practice has long labored under a reputation for inaccessibility, professional specialization, and narrowly fact-specific court rulings. All these factors have functioned to distance patent law from the historical mainstream. Recent years have seen a number of important scholarly inroads into the social, political, and ideological landscape of the patent system.²⁰ Even so, the historical law of patents remains in many ways unmapped, and its connection to the broader setting of legal and political institutions unclear. This obscurity is unfortunate, since patent law was far from being a legal backwater. Instead it was a ubiquitous feature of rapid technological development, a palpable force in the lived experience of American industrialization, and an integral part of the law.

For a start, it would be hard to overstate the number of major new technologies that were subject to patent litigation in this period. Well-known bids for legal control such as Bell's claim to the telephone, Morse's to the telegraph, Edison's to the electric lamp, and the Wright Brothers' to the airplane are just the beginning. A short list of other highlights would include legal battles over the waterwheel, sewing machine, mechanical reaper, barbed wire, baking soda, fountain pen, typewriter, cash register, phonograph, bicycle, and automobile. These conflicts were not mere intramural disputes among inventors and manufacturers; they were often highly public matters, bound up in the heated politics of monopoly, and regular fodder for scandal, agitation, and congressional intervention.

At the same time, patent practice was a prominent and well-integrated branch of the law. An astonishing proportion of federal cases in the major industrial jurisdictions were patent cases: in some courts, patent matters

made up a third or even a half of the decisions published by the court reporters.²¹ Throughout much of the nineteenth century, patent business was a staple activity of the elite bar. Senators and cabinet officials routinely argued patent suits in the Supreme Court and lower tribunals. One indicator of the reach and prestige of the field is that no fewer than three members of President Lincoln's cabinet had been involved in high-profile patent matters, as had Lincoln himself.

Patent law is overdue, then, for a move into the historical limelight. To the uninitiated, the story that follows offers a guide through the world of courts and litigation strategy, subjects that have hitherto confused rather than enlightened many students of the history of technology. Patent litigation need no longer be a "black box"—the technologists' term for a process whose inputs and outputs are observed, but whose inner workings are not. To aficionados of law, this narrative gives a new vantage point for considering old questions. Patent law raises many of the same themes that have traditionally structured the field of legal history, including the role of law in economic development, the responsiveness of legal institutions to broader changes in society, and the tension between the law on the books and the law in action. The Bell story suggests that there is no clear, unmediated relationship between the patent system and economic change. That there was a relationship, however, is revealed by the parts that patents came to play in the transformation of the industrial economy.

Looking back from our present age of scientific, large-scale, corporate research and development, Alexander Graham Bell is sometimes seen as an archetype of the independent inventor—the kind of figure for whom the patent system was designed. Since "[t]he prototypical innovation contemplated by the patent law is made by an individual inventor," modern legal scholars have suggested, "Alexander Graham Bell is in many ways the icon of the patent system."²² To his contemporaries, however, Bell and his patents came to represent something quite different: the growing use of intellectual property by large corporations.

Bell received his patents at a time of rapid industrial change. The late nineteenth century witnessed a wave of new inventions and new business forms that is often described as the beginning of a "second industrial revolution." Like the first industrial revolution of iron, steam, the

joint-stock company, and the factory system, the second industrial revolution consisted of linked technological and institutional developments. One was the opening of new industrial sectors, especially in science-based fields: electrical light, power, and communications; motorized transportation; synthetic chemicals; and so on. The other major development was a rapid rise in the scale of corporate organization—crudely put, the rise of “big business”—which gave firms new capabilities to control markets and to manage technology. Thanks to their position at the intersection of these two trends, patents became enormously important to the organization of the new economy.

Gauging the effect of patents on society means looking at how they were exploited in practice, not just how they were litigated in the courts. Accordingly, the story of Bell’s patent rights leads us into one of the great stories of American business history: the rise of the American Bell Telephone Company, later and better known as AT&T, which dominated the country’s telephone service for a century until its breakup in the 1980s. American Bell was an enterprise constructed around patents; its business strategies, corporate organization, and financial prospects largely depended—at least at first—on legal ownership of key inventions. From about 1880 until the early 1890s, American Bell exercised monopoly control of the telephone industry by laying exclusive claim to the transmission of speech by electricity and forcing all potential competitors from the field. Patent power was placed squarely in the limelight. When Alexander Graham Bell’s rights came before the U.S. Supreme Court in 1887, they sustained a “hundred-million-dollar” corporation and made for a trial of unprecedented size, expense, complexity, and controversy.²³

Without the Bell Company’s early dominance, the entire evolution of American communications could have taken a quite different track. This book is the first to explore fully the role of the Bell patent rights in that process: not only by explaining the court judgments that created the monopoly, but also by tracing the role that patents played in forming the emerging telephone industry. An argument for the deep embeddedness of patents in the strategy and structure of a high-technology industry may seem straightforward, but it actually represents a departure in the history of both the telephone and the “rise of big business.” Historians have tended to treat patents either as an aspect of the innovation process

or as an occasional and awkward weapon of market competition. Organization without patents produced great corporations, they (rightly) point out; patents without organizations never did. But one can accept these observations and still arrive at a fuller appreciation for the multiple uses of patents in the growing corporate economy, as tools of contracting, alliance, capital formation, and technological cooperation. True, patents did not *make* big business big, but they helped to shape the development of the new industrial giants.

Finally, the Bell story would be incomplete without some attention to the world beyond the United States. The second industrial revolution was an age of globalization, characterized by growing international flows of trade, capital, labor, and technology. Inventions moved readily between countries, borne by travel, trade, and the beginnings of multinational industrial enterprise. National experiences were shaped by continuous exchanges of people, technology, and ideas. In the case of the telephone, these transnational elements are inescapable. Not only did the American invention cross borders within its first few years of existence, but so did its inventors and commercial pioneers, its business models, and its patents. These international connections and transitions are as ripe for study as the national industries they produced, and—my central interest in this work—as much shaped by law.

A global history of the telephone industry is beyond the scope of this work. Instead, the book will focus its overseas sojourning on one country, enough to gain comparative and transnational leverage while respecting the details of the local story. That country is Britain, by far the most lucrative overseas market for the telephone, and the site of a telephone patent struggle dramatic and vicious enough to rival that of the United States. Between the United States and Britain lies a fascinating contrast of legal systems, politics, and cultures, crosscut by the commercial adventures of the patent-holders (in Britain, these were primarily Bell and Thomas Edison) who fought for monopoly. The underlying technology was identical in both countries, yet understood quite differently by their respective courts, which provides a kind of experimental “control” for examining the two national patent systems.

Patent law thus reminds us that, however global and apparently seamless the spread of an industrial revolution, nation-states still played a

central role in the process. Identical basic inventions supported different configurations of patent rights (or a lack thereof) from one country to the next, helping to decide which companies would commercialize the technology and under what competitive conditions. These rights depended on national legal systems for construction and enforcement. For all the speed with which its major technologies and corporate actors diffused internationally, the second industrial revolution was significantly influenced by its local legal environments.

For much of the past hundred years, it would have been hard to convince people that patent law was a subject rich in drama. Today, the prospect is less daunting. The massive expansion of patenting and patent litigation in the early twenty-first century has produced a slew of much-decried results: billion-dollar judgments; opportunistic “patent trolls”; costly, unpredictable litigation; and an ever-rising flood of patents—some trivial, some promising enormous riches, and some both. Although it remains possible to explain and extol the social benefits of patents as tools of innovation policy, a gloomier view has become widespread. The institutions of the patent law, once feted for adding “the fuel of *interest* to the *fire* of genius,” have instead turned sinister: “Judges, bureaucrats, and lawyers,” as one critique of the U.S. patent regime warns, “put innovators at risk.”²⁴

Neither the defenders nor the detractors of the patent system will find unambiguous confirmation in these pages. The patents described here rewarded invention, protected a disruptive new technology from hostile incumbents, and made possible grand schemes of engineering and corporate construction. They also monopolized an industry, confounded the courts, and placed the fate of a transformative communications technology in the hands of the lawyers. For anyone who seeks a modern lesson in this story, it may well be the simple one: all this has happened before, if not in its precise details, then at least in familiar outlines. Conflicts within and about the patent system are an old thing in America and, comfortably or otherwise, were probably more wrenching in former times than in our own.



Invention in the Lawyers' World

IN 1836, AN IMPOSING BUILDING began to rise in the center of Washington, D.C. The site, seven blocks east of the White House, had been specially reserved in Pierre L'Enfant's original plan for the city. L'Enfant had proposed a patriotic church, "intended for national purposes, such as public prayer, thanksgiving, funeral orations, &c., and assigned to the special use of no particular Sect or denomination, but equally open to all." This pantheon-like structure would also house monuments to the heroes of the Revolutionary War and to "such others as may hereafter be decreed by the voice of a grateful Nation."¹ No national church was built, and for decades the land was used as an orchard.² Finally, the site was dedicated instead—some thought appropriately—for the construction of the new Patent Office.

Within a few years, the office's two-block-wide South Wing and massive Greek Revival-style portico loomed over the neighborhood of low brick and timber houses. The patent-examining staff moved there in 1840, after which the building steadily began to fill with clerks, files, technical drawings, and roomfuls of the miniature wood-and-brass models that patent applicants were required to provide with their applications. Various items of national importance were transferred to the carefully fire-proofed facility. The collection included the original Dec-

laration of Independence, which from 1841 to 1876 hung framed in a third-floor display cabinet, slowly fading to illegibility in the sun.³ By midcentury, a hundred thousand people were said to visit each year to view the artifacts on display.⁴ Construction continued around them. The whole structure would not be complete until after the Civil War, by which time the Patent Office complex was reportedly the largest office building in the country.⁵

If the U.S. government of the nineteenth century was a deceptively low-profile force—"a government out of sight," as one scholar has dubbed it—then the patent system was one of its most visible manifestations.⁶ The hulking Patent Office in the capital was only one piece. Elsewhere, the patent system existed wherever a federal court sat, a patent lawyer kept an office, or an inventor could mail a package of papers to Washington along with the \$30 or \$35 application fee.⁷ Hundreds of thousands of Americans applied for a U.S. patent between 1790 and 1900, collectively receiving some 650,000 issued patents. Millions more used patented technologies. Most doubtless did not notice or care about the intellectual property rights attached to their everyday items, despite the "U.S. Patent" markings stamped on their sewing machines, tools, firearms, and railroad cars, and printed on the packaging of their food and drugs.⁸ But many did, thanks to the patent wars that flared up around them.

Among those conflicts, the telephone patent fights may have been unusually large and complex, but they were part of a broader phenomenon. Major new technologies were commonly patented in nineteenth-century America. "Great inventors" (a subjective term to be sure, but here meaning those later hailed as such by historians and biographers) were, as a class, closely engaged with the patent system.⁹ Men of genius were not the only beneficiaries of the law. Any lucrative new industry was an invitation for opportunistic patent claimants, or the purchasers of patents, to come forward in the hope of seeking windfall gains. As a result, new technologies characteristically experienced a phase of heavy litigation, along with intense trading and speculation in patents, while the various pioneers and followers in the field clarified their respective legal entitlements. Massive campaigns of nationwide litigation were not uncommon: the Bell Company filed around six hundred suits to enforce its basic patent, but that was far from being the most prolific enforcement campaign.