

Steam Power and Patent Law Development in the Eighteenth Century

Perseverance against Great Odds

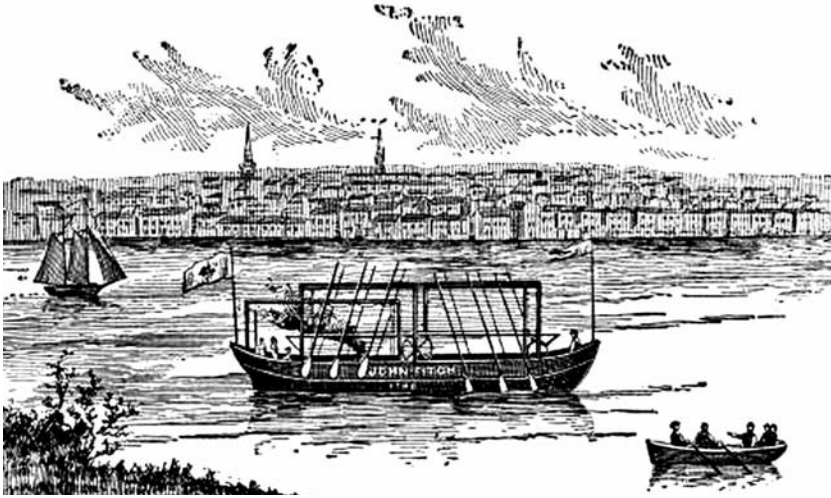
ON MONDAY, AUGUST 20, 1787, a crowd gathered at the Front Street wharves on the banks of the Delaware River in Philadelphia. Curious, the people had come to watch John Fitch and Henry Voight launch their experimental steamboat, aptly named *Perseverance*. The inventors were an interesting pair. Fitch radiated detached impatience, whereas the jovial Voight conversed with the speculators in the crowd. A “crank-and-paddle” engine, which consisted of six sets of steam-powered oars, propelled the narrow craft. Hoping to attract investors, Fitch offered free rides aboard *Perseverance* to influential observers. Several leading politicians, including Oliver Ellsworth (who would later serve as the second chief justice of the U.S. Supreme Court), Samuel Johnson, Rufus King, and Edmund Randolph, accepted rides in the strange-looking craft, which churned several hundred yards upstream before returning to the dock. Johnson later sent a congratulatory certificate to Fitch; however, neither he nor any of the other spectators offered financial support.¹ While Fitch and Voight promoted their invention, Johnson, Ellsworth, and their colleagues at the Philadelphia Convention meeting three blocks away sought support for their own creation, the U.S. Constitution. On August 18, two days before Fitch and Voight’s



John Fitch. "Portrait of John Fitch," in James T. Lloyd, *Lloyd's Steamboat Directory and Disasters on Western Rivers* (Cincinnati, OH: James T. Lloyd, 1906), 18

demonstration, James Madison had spearheaded the debate over a constitutional clause for the "promotion of useful arts," which the convention approved on September 12, 1787.²

Attempts by Fitch and his colleagues to create steamboat businesses in an era of economic uncertainty and rapid political change were the subject of a vital chapter in the history of American transportation. Fitch hoped that the fledgling federal government would provide European-style legal protection for his inventions. In the sixteenth and seventeenth centuries, industrial development had unleashed advancements in iron forging, building construction, and steam power. Modernization had also created powerful nation-states that granted patents and other exclusive monopolies to increase royal authority. European inventors often secured aristocratic patrons who helped them obtain royal patents in return for a share of the profits. Yet in America, despite the abundance of land and waterways that made it a natural arena for the development of steam power, European patent systems were unrealistic because of the sheer size and sparse population of the frontier.



John Fitch's steamboat at Philadelphia. "John Fitch's Steamboat at Philadelphia," in E. Benjamin Andrews, *History of the United States from the Earliest Discovery of America to the Present Time* (New York: Charles Scribner's Sons, 1894), 2:290

Early inventors such as Fitch and Voight had to find new methods to legally defend their inventions. Rather than discovering a single solution for their problems, these entrepreneurs learned to rely on a combination of state-granted monopolies and personal reputations to discourage competitors. In particular, Fitch learned that in an increasingly democratizing American society, cultivating a reputation as a heroic scientist who was laboring for the public good would help him secure the customers, patrons, and public support that strong patent laws would have provided in European circles. In this regard, Fitch did more than pioneer steam technology. He developed legal precedents and business techniques that future steamboat inventors would adopt with increasing regularity.

The Industrial Revolution

The framers of the U.S. Constitution were not the first political leaders to consider the merits of regulating scientific inventions.³ Since the late Middle

3

Ages, European governments had recognized the value of encouraging technological achievements by promising inventors certain exclusive rights over their discoveries. In the 1400s, the English government took the lead in promoting scientific development through royally granted monopolies. Under that system, monarchs issued monopolies to political allies to raise money or to protect local industries from foreign competition. In 1449, to protect English products from cheaper Italian imports, Henry VI awarded the first British patent to John of Utynam, for stained-glass manufacturing. And throughout the fifteenth and sixteenth centuries, the English monarchy granted patents to ironworkers, stonemasons, shipwrights, and other artisans. These franchises took several legal forms: charters to private corporations, letters patent with directives to the public, and closed letters that provided private instructions to key individuals. Just as titles of nobility gave landowners the right to govern peasants who lived on their lands, patents gave promising inventors exclusive rights to reap the profits of their inventions. In time, these monopolies became an accepted part of English common law.⁴

As part of her efforts to create a modern nation-state, Elizabeth I granted monopolies to promote English mining, iron working, and shipbuilding. In 1557, she granted the Stationers Company a powerful monopoly over all printed material in England. Elizabeth also used patents to attract Dutch, French, and German artisans to England with the promise that they could receive monopoly rights as original inventors, even if they imported only the work of others.⁵ In 1623, Parliament drew from medieval guild laws to pass the Statute of Monopolies, limiting the number of exclusive franchises the monarchy could grant. Just as master craftsmen could bind apprentices to two seven-year terms and thus control their labor, inventors could now gain the profits from their inventions for a maximum of fourteen years. The statute also stipulated that when a monopoly expired, its details would be made available to the public.⁶ Parliament subsequently passed the Statute of Anne in 1710, which distinguished copyrights from patents and gave authors control over their written work for limited periods. Because of two landmark legal cases, *Millar v. Taylor* (1769) and *Donaldson v. Beckett* (1774), Parliament declared authors had a common-law right to their intellectual property for twenty-eight years, but grants to inventors were based on royal prerogatives. These precedents formed the basis for English patent law until the mid-nineteenth century, and they were part of the English legal tradition that settlers brought with them to North America.⁷

Social Consequences of Technological Change

By the mid-1700s, the creation of English patent law had achieved its desired result—the industrial development of Great Britain. Canals, clocks, foundries, mechanical looms, toll bridges, gristmills, sawmills, whiskey stills, windmills, and rudimentary steam engines dotted the English landscape. The rise of machines redefined labor and forced industries that could not afford new technology to increase the productivity of their human workforces. As a result, industrialization had a cumulative effect on increasing the rate of production in the workplace. These trends soon became apparent not just in Britain but also in much of western Europe.⁸

Of all the technological developments in the late eighteenth century, steam power had perhaps the most diverse range of industrial uses. British inventor Thomas Newcomen perfected the first steam engine capable of industrial use in 1712. Matthew Boulton and James Watt became partners in 1775 and created an engine based on a high-pressured steam boiler and piston, as opposed to earlier models that relied on condensation to operate. Boulton and Watt patented their invention and opened the first steam engine factory. Following a successful steamboat trial in Lyons, French inventor Claude-François-Dorothée, marquis de Jouffroy d'Abbans, obtained a French patent over steam travel in 1783.⁹ Industrialists used the rudimentary engines to pump water out of coal mines and to run power looms. The development of “vessels powered by fire and steam” visibly had far-reaching social effects and created new communication and trade networks. The evolution of steam engines on both sides of the Atlantic captured the public’s imagination, and the engines became a symbol of increased industrialization.¹⁰

Development of Steam Technology in North America

Effective patent policies helped Britain emerge as the leading producer of steam technology in the world. Given their shared history and culture, when Americans sought to establish their own industrial and legal systems, they did so with British precedents in mind. Chronic labor shortages, the need for fast and reliable transportation, and the opportunity to settle the frontier made the idea of steam power popular in eighteenth-century North America.¹¹ Steamboat inventors made frequent trips to Europe, seeking capital and advice for their

experiments. Conversely, English, Scottish, and Irish mechanics well versed in steam power emigrated to work in the foundries and shipyards of Philadelphia, Boston, and New York City.¹²

One such émigré was Christopher Colles, an Irish native and former protégé of Richard Poacoke, a well-known Anglican bishop and anthropologist. Colles perfected his mathematical and engineering skills by constructing a canal across the Shannon River before departing for America with his family in August 1771. Skilled at attracting European patrons, Colles was disheartened when a lecture at the American Philosophical Society on the benefits of steam power met with roaring applause but little financial support. He therefore sent pamphlets to leading Philadelphia citizens and colonial legislatures to propose a canal system in return for governmental land grants, the one form of wealth readily available in the colonies. In 1774, the Philadelphia City Council agreed to fund a plan by Colles to supply the city with water using a steam engine. Unfortunately, a lack of funds with which to purchase much-needed equipment and the services of skilled artisans led to the eventual failure of the project.¹³

One individual who learned much from Colles's pioneering endeavors was John Fitch. The son of hardscrabble Connecticut farmers, Fitch used his affinity for mathematics to escape rural life. After brief careers as a mechanic, a craftsman, and a land speculator, he became interested in steam travel. Fitch later wrote in his memoirs that a chance encounter in April 1785 with a wealthy man in a horse-drawn carriage inspired him, in a dramatic moment of insight, to design a steam-powered carriage: "I soon thought that there might be a force procured by Steam and set to and made a draft. And in about one weeks time gave over the Idea of Carriages but thought it might answer for a Boat or better yet for a first rate man of war."¹⁴ More probably, Fitch got many of his ideas from William Henry, a Pennsylvania gunsmith and inventor who perfected plans for a functional steamboat but who, like Colles, failed to secure financial support to create a working engine.¹⁵

While Fitch struggled with his designs, rival inventor James Rumsey cultivated support for his own fledgling steamboat business. A Maryland native, Rumsey worked as an innkeeper and amateur engineer. He possessed a keen mind but, unlike the impulsive Fitch, tempered his creativity through methodical experimentation. In 1780, Rumsey built a working model of a steam-powered boat that pushed its way along riverbeds by a series of poles.¹⁶ Drawing from European precedents, Rumsey courted the friendship and patronage of wealthy Americans—

including George Washington, Thomas Jefferson, James Madison, and John Marshall—who frequented his inn.¹⁷

The Race for Public and Private Patronage

In 1783, Rumsey borrowed from Colles's techniques to ask the Continental Congress for a grant of western land that he could use or sell to finance his research in steam travel. To his chagrin, he learned that Philadelphia inventor James McMechen had already petitioned Congress for a land grant to finance a pole-powered steamboat, which bore a strong resemblance to the vessel in Rumsey's own blueprints. Congress appointed a subcommittee to examine the competing claims, and on July 11, 1783, it produced a report that lauded McMechen's goals but postponed giving him support until he developed a working steamboat. In 1784, McMechen publicly renounced his claims as inventor of the pole boat in exchange for a partnership with Rumsey. The two men jointly appealed for additional funds. Since Rumsey carried the written support of George Washington and Thomas Jefferson, Congress took his petition seriously.¹⁸

Hugh Williamson, who chaired the congressional subcommittee appointed to resolve the steamboat controversy, wrote to Washington and Jefferson for confirmation of Rumsey's reliability. Washington voiced his support, whereas Jefferson nonchalantly admitted to having seen a demonstration of Rumsey's boat.¹⁹ On May 11, 1785, Rumsey and McMechen received a congressional promise of twenty thousand acres of land west of the Ohio River—if they could produce a steamboat that ran fifty miles a day for six consecutive days without repairs.²⁰ Riding a wave of success, Rumsey successfully lobbied the Virginia, Maryland, and Pennsylvania state legislatures for monopolies on steam travel. Nonetheless, he faced considerable opposition in Virginia and won a steamboat monopoly in the Old Dominion only with Washington's timely support.²¹

Desperate to make up for lost time, Fitch attempted to imitate Rumsey's methods in securing wealthy patrons and federal protection for his steamboat experiments. In 1785, he presented his steamboat plans to the American Philosophical Society. Fitch also petitioned various state legislatures for monopoly privileges, and on August 30, he asked Congress for his own western land to support steamboat experiments.²² Congress, having already pledged support to Rumsey, returned Fitch's documents to him the following day. In his autobiography, an infuriated

Fitch blasted the “Ignorant Boys of Congress” for their lack of foresight.²³ The disgruntled inventor then wandered through Pennsylvania, Maryland, and Virginia seeking help from anyone who would listen to him, including Benjamin Franklin and George Washington. The retired general politely heard what Fitch had to say but explained that he had already given his support to Rumsey. Consumed with anger, Fitch lashed out against Rumsey, his patrons, and the world in general.²⁴

Franklin considered Fitch’s plans unworkable and reportedly offered him a meager \$4 for his blueprints. Franklin himself entered the steamboat controversy in September 1785, delivering a paper titled “Mechanical Inventions” to the American Philosophical Society. Borrowing heavily from a work published in 1769 by Italian inventor Daniel Bernoulli, he rejected paddle wheels as an inefficient means of propulsion. He instead promoted plans for a steam-powered boat that propelled a jet of water through the stern to move the vessel forward. Franklin’s engine bore similarities to pressure-powered water pumps, which the inventor had installed on Philadelphia fire engines. Following the lead of America’s foremost scientist, many inventors rushed to develop their own jet engines.²⁵

Feeling exploited by Franklin and the wealthy members of the philosophical society, Fitch appealed to working-class Americans as a fellow mechanic in need of assistance. He also established a partnership with Henry Voight, a Dutch-born silversmith and owner of a wire-making mill who suggested pursuing a paddle-powered steamboat. In addition, Fitch received the support of a number of Philadelphia mechanics, including Christopher Colles, and he used their influence to create a steamboat company in April 1786, selling shares at a modest \$20 each. The company raised \$300 in less than a month—mostly from fellow inventors and small business owners in Philadelphia. But despite his promising start, Fitch repeatedly argued with his investors and began to lose financial support. New Jersey attorney Richard Stockton, who served as president of Fitch’s corporation, tried to calm the volatile inventor and pacify his backers. Fitch also faced legal pressure from several competitors. Inspired by Franklin’s water-jet plan, Pennsylvania inventors Arthur Donaldson and Levi Hollingsworth collaborated to build a marketable steamboat. To circumvent Donaldson, Hollingsworth, and Rumsey, Fitch applied for steamboat monopoly grants in Delaware, Pennsylvania, New Jersey, and New York. Such a patchwork of overlapping legal claims led to an intense debate in the Pennsylvania state legislature, dubbed the case of *Fitch v. Donaldson*.²⁶

In his petition to the Pennsylvania General Assembly, Fitch asserted he was the true inventor of the steamboat. He portrayed himself as a reasonable man

who had offered his rival a partnership. Donaldson countered that he had invented the idea of a water-jet steam engine, adding that he had, in fact, created an engine based on steam-powered wheels or turbines. Fitch argued he should receive a broad patent for his invention because it offered correspondingly wide benefits to society. He contended that legislatures should create coherent patent laws designed not to enrich a few inventors but to reward inventors whose work enriched the lives of all citizens.²⁷

In particular, Fitch insisted upon a patent that excluded similar grants for others during his fourteen-year patent term. A legal arrangement of that type would give him control over future inventions that conflicted with his projects. Donaldson argued there were no precedents for such a patent under English law.²⁸ Invoking republican rhetoric, Fitch retorted that the English were “neither wiser nor more virtuous than the inhabitants of Pennsylvania.” While waiting for the legislature to end its deliberations, he received word from his friend Caleb S. Riggs, a New York attorney, that he had triumphed over other contenders, including inventor John Stevens, and received a steamboat monopoly in New York. Riggs reported, “It is now become a Law of this State that you should have the exclusive rights of building all boats to be propelled by the force of steam agreeable to the prayer of your petition and that for the term of time you worked for.”²⁹ Two weeks later, on March 28, 1787, the Pennsylvania legislature granted Fitch similar rights to operate steamboats within state borders.³⁰

With his legal base secure, Fitch petitioned Virginia congressman James Madison to support a national monopoly on steam travel, and he again implored the Continental Congress for land grants to support his endeavors. But Fitch’s latest plea for aid failed when a group of congressmen led by Andrew Ellicot demanded the inventor produce a functional steam-powered vessel before they would consider the matter of support. Undeterred, Fitch announced to the Philadelphia press in December 1787 that his steamboat was completed and ready for public demonstrations.³¹

*Promoting “Scientific and Useful Arts”
at the Constitutional Convention*

The Philadelphia Convention represented a defining, though inconclusive, moment in the development of U.S. patent law. During the colonial period,

the English monarchy technically retained the right to grant patents in the North American colonies, though popularly elected colonial legislatures frequently assumed such powers. Massachusetts issued the first colonial patent in 1646, awarding it to Joseph Jenkes for a mill that manufactured wheat scythes. By the mid-1700s, a variety of patent systems existed throughout the colonies, all of which operated alongside British patent law. South Carolina, however, was the only colony to pass legislation that specifically recognized the rights of inventors to their work for a limited number of years. Following the Revolutionary War, many inventors appealed to the confederation government for patents. Lacking the specific power to recognize patent claims, the Continental Congress referred such matters back to the states. Although Madison and other Constitution framers cited patent reform as a pressing political need, the subject was barely addressed at the Philadelphia Convention. In August 1787, after delegates had forged compromises on representation and slavery, they turned to the issue of promoting inventions.³²

The delegates at the Constitutional Convention also faced outside pressure to develop an effective patent policy. Tench Coxe, a Philadelphia merchant and former Loyalist turned ardent Federalist, supported a strong federal patent system as a precondition for industrial development. On August 9, 1787, he claimed in a well-received speech that governmental support for inventions would “with great convenience enable an enlightened society, established for the purpose, to offer liberal rewards in land for a number of objects of this nature.”³³ Convention delegates took Coxe’s suggestions to heart. On August 18, James Madison and Charles Cotesworth Pinckney proposed that Congress control the power “to secure to literary authors their copyrights for a limited time” and to “encourage by premiums and provisions, the advancement of useful knowledge and discoveries.” By linking the patent process to the social good, Madison and Pinckney borrowed from British precedents. Both men first considered a council of state similar to the British model that encouraged inventions, but they rejected the notion as too “European.” Madison and Pinckney instead suggested a system of patents and other entitlements to promote agriculture, trade, and manufacturing. Perhaps eager to dispose of the issue without opposition, the delegates referred the matter to the convention’s Committee of Detail.³⁴ After two weeks of debate, on September 12, 1787, the committee presented a statement that became Article I, Section 8, Clause 8, of the U.S. Constitution: “Congress shall have the Power . . . 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.” Records of the convention contain little information on the debates over the measure.³⁵

The lack of discussion about the patent clause at the Constitutional Convention carried through to the ratification debates. Although Massachusetts, New Hampshire, and North Carolina called for provisions against monopolies in general, the intellectual property clause failed to generate controversy.³⁶ The delegates possibly agreed that the federal government, following English legal traditions, should maintain the right to grant patents. As Madison noted in *Federalist* no. 43, “The copyright of authors has been solemnly adjudged, in Great Britain, to be a right of common law. The right to useful inventions seems with equal reason to belong to the inventors.” States could not defend patent rights, and most had granted such authority to Congress.³⁷

Attempts to Develop Steamboat Companies

Having secured governmental protection for their inventions, Fitch and Rumsey realized that funding for their inventions would have to come from ordinary Americans as much as wealthy benefactors. Public demonstrations were therefore necessary to attract public attention and potential investors. Rumsey kept McMechen at a distance and enlisted his brother-in-law, Joseph Barnes, to help adapt a Newcomen engine and create a water-jet-powered steamboat. The inventor carried out a successful steamboat demonstration on December 3, 1787, on the Potomac River near Shepherdstown. Before a throng of enthusiastic spectators, Rumsey invited several young women aboard, and with his assistant Charles Morrow at the helm, he steamed half a mile upstream, reversed course, and passed the town before docking to a cheering crowd. Another successful steamboat experiment followed eight days later.³⁸ To promote his project, Rumsey also published a pamphlet entitled *A Short Treatise on the Application of Steam*.³⁹ Primarily a sales brochure, the treatise contained a chronology of Rumsey’s steamboat experiments, a technical description of his vessel, and affidavits testifying to its success. Fitch countered with a publication entitled *The Original Steam-Boat Supported; or, a reply to Mr. James Rumsey’s Pamphlet*, which asserted his claim as the inventor of the steamboat and accused Rumsey of stealing his ideas.⁴⁰ Joseph Barnes responded in turn with *Remarks on Mr. John Fitch’s Reply to Mr. James Rumsey’s Pamphlet*, which attested to the originality of Rumsey’s jet-powered boat.⁴¹

Rumsey moved from Shepherdstown to Philadelphia in March 1788 to publicly defend his interests. With support from his cousin William Rumsey, as well as Washington and Franklin, he presented his steamboat plans before the American Philosophical Society. At Franklin's urging, wealthy Philadelphia residents formed the Rumseian Society to counter Fulton's steamboat company.⁴² Rumsey also sought to appear benevolent in the eyes of the public by offering Fitch a reconciliation and suggesting a merger of their corporations. Insulted by the offer of a mere one-eighth of the profits, Fitch turned down the proposal. Rumsey then traveled to England to buy a Boulton and Watt engine and hire engineers. Worried that Fitch might try to follow suit, Franklin and his associates John and Benjamin Vaughn wrote to British investors discrediting Rumsey's rival.⁴³

In Paris, Rumsey stayed with the American ambassador, Thomas Jefferson.⁴⁴ Then, in the summer of 1788, he traveled to Great Britain to meet with Matthew Boulton and James Watt, who were so pleased by Rumsey's plans that they offered him a partnership. Specifically, they sought permission to use Rumsey's plans for a spiral boiler. Both had experimented with the concept of passing water through spiral tubes enclosed within the engine's firebox. Rumsey inverted Boulton and Watt's idea, sending heat through tubes enclosed in water. Boulton and Watt were suitably impressed, and they promised to withdraw their own patent rights so that Rumsey could place a legal claim to his work.⁴⁵

Boulton and Watt's initial positive impression of Rumsey broke down shortly after their first meeting. In the United States, Rumsey was a gentleman of standing, with considerable support from leading citizens. But in Great Britain, his public reputation meant nothing. Boulton and Watt expected him to cut his ties to the Rumseian Society and form a partnership with them. Rumsey shot back with a threat to take his newly acquired engine to Ireland, where British patent laws did not apply. He reminded Boulton that British patents were not legal in the United States and insisted that his steam engine ideas were superior to those of any competitors. The situation deteriorated, and Rumsey ultimately refused any offer of partnership.⁴⁶ While in London, he continued to experiment with steam power and kept abreast of his ongoing conflict with Fitch in the United States. He confided to Charles Morrow, "I am astonished at Fitch's perseverance and rascality. I wish you had got him taken with a writ, however on the whole I think his Exertion will operate against him."⁴⁷ By 1791, Rumsey had secured three British patents for spiral boilers and, with the backing of several patrons, built a ship named the *Columbian Maid*. He had worked hard to cultivate a popular repu-

tation in Great Britain as a successful inventor, yet at the same time, Rumsey had incurred great debt as his steamboat experiments dragged on. To help stave off financial collapse, he accepted the humiliating position of secretary and agent for his own creditors.⁴⁸

Fitch faced similar financial problems in Philadelphia, and in 1787 and 1789, stockholders reorganized his firm and reduced his voting power. Fitch also suffered technical setbacks. In the summer of 1788, during a test run on the Delaware River, *Perseverance's* engine failed: passing boatmen taunted Fitch and Voight as the hapless inventors waited for the tide to carry their vessel back to shore.⁴⁹ Fitch's situation temporarily improved, however, with the assistance of stockholder William Thornton. Thornton was a man of exceptional intelligence. Born in the Virgin Islands, he was trained as a physician in Scotland, but he also excelled as a painter, composer, engineer, and architect. In 1786, he emigrated to Philadelphia, where he designed the headquarters for the Library Company of Philadelphia. He would also plan several buildings in the future national capital of Washington, DC. Thornton bought out several members of Fitch's company and worked with the beleaguered inventor on his steamboat. On April 16, 1790, Fitch, Voight, and Thornton arranged a trial run on the Delaware River and pushed *Perseverance* to a speed of eight miles an hour. Although they declined to provide financial support, the governor and the Council of Pennsylvania capitalized on Fitch's newfound popularity and presented him and his partners with a silk flag to commemorate their achievement.⁵⁰

The Struggle to Establish a Federal Patent System

While Rumsey struggled to obtain British recognition for his inventions, Fitch and other steamboat promoters demanded comprehensive legal protection for their work in America. The intense debate about the issuance of state monopolies and federal patents reflected the political turmoil of the 1780s and the need for legal reform. In their quest for governmental recognition, engineers such as Fitch and Rumsey wielded considerable influence in the development of American patent policy. Under pressure from inventors, manufacturers, and President Washington, Congress enacted a patent act on April 10, 1790. The act gave the Department of State the authority to issue patents, and it required a panel consisting of the secretary of state, the secretary of the treasury, and the attorney general

to determine “useful” and “important” requests. Upon approval, an inventor paid a fee, registered the invention, and received a federal patent.⁵¹

The Patent Act of 1790 appeared simple, but in practice, it proved unworkable. Many inventors complained that federal patents were expensive, hard to obtain, impossible to enforce, and limited in scope. Secretary of State Thomas Jefferson condemned the very concept of patents as antidemocratic. In truth, he and his colleagues lacked the time to review applications. On February 4, 1791, Jefferson lobbied Congress to revise existing U.S. patent law. Three days later, he submitted a bill that made the application process more costly and time-consuming. Specifically, the bill required an applicant to petition the secretary of state for a warrant that testified to the usefulness of the invention. After paying a fee directly to the treasury, the inventor then had to register with every U.S. federal district court and publish notices of the invention three times in a major paper in each of those districts to warn away other competitors.⁵²

While Jefferson drafted the bill, the Patent Board reviewed requests from John Fitch, James Rumsey, Henry Read, and John Stevens. To avoid confrontations, the board canceled a hearing with the inventors and urged them to wait for the passage of the new patent bill, which was before Congress at the time.⁵³ Fitch protested the bill, stating he “had no idea that he must go all the way from Kentucky to Cape Cod, and quite the Distance of Province of Main[e] to publish his inventions, and to pay out large fees wherever he goes for the same.”⁵⁴ For once on the same side as Fitch, Joseph Barnes published a polemic that condemned Jefferson’s bill for favoring European technological discoveries over American inventive genius.⁵⁵ Despite Barnes’s strong words, the ever-wary Fitch suspected Jefferson and Rumsey of collusion to keep him from developing a steamboat franchise.⁵⁶

Jefferson resubmitted his bill to Congress early in March 1792. The measure now required an applicant to register with the secretary of state, pay a fee, and provide a short description and model of the invention. The inventor, however, still had to file and register the patent in every judicial district in the United States. The new bill also allowed an offender to claim ignorance of the law or irrelevancy of the patent in question as valid defenses. It specified that patents were the private, intellectual property of their owners and that the public would not be allowed to view related documents until the originals expired. In addition, the bill asserted that federal patents trumped any state licenses granted before the ratification of the U.S. Constitution. Furthermore, applicants had to be American citizens.⁵⁷

When Congress reconvened in January 1793, it appointed a committee, chaired by Hugh Williamson, to consider Jefferson's bill. The following month, the bill passed both houses of Congress to become the Patent Act of 1793. In 1800, Congress revised the act to allow resident aliens to apply and to set heavy fines for those who infringed on patent rights.⁵⁸ However, like its predecessor, the revised act allowed applicants to secure patents for inventions regardless of how similar their discoveries might be. Fitch, Rumsey, Read, and Stevens quickly secured federal patents for their steamboats under the new federal guidelines. However, realizing the worthlessness of such documents, the inventors quickly turned to the states to protect their work.⁵⁹

Rumsey did not live to see his federal patent approved. He died in 1792 of an aneurysm while attempting to rekindle public interest in his steamboat experiments through an address to the British Society of Arts in London. Fitch traveled to France at the invitation of Aaron Vail, one of his stockholders and the U.S. consul in L'Orient. But in addition to a lack of diplomatic skills, Fitch suffered from horrendous timing. He arrived at the height of the French Revolution, and with the nation in turmoil, he was unable to find financial backers for his experiments. He then traveled to Britain, only to find that no British investor would support him given the rumors spread by Franklin and Rumsey. With no funds left, Fitch worked his way back to America as a common sailor.⁶⁰ Facing economic ruin and emotional collapse, he wandered throughout the United States for several years before settling in Bardstown, Kentucky. Without success, he continued to experiment with steamboats. As Fitch had spent much of his life attempting to attract investors and patrons, he now felt the need to publicly justify his life. He thus wrote a lengthy autobiography that alternated between detailed descriptions of his steamboat experiments and embittered diatribes about his inability to profit from such work. Almost as if composing his own epitaph, a despondent Fitch at one point wrote, "The day will come when some great powerful man will get fame and riches from my invention, but nobody will believe that poor John Fitch can do anything worthy of attention."⁶¹

In 1798, Fitch committed suicide, combining a lethal dose of opium pills with wine. In many ways, his failure reflected the inability of the young nation to develop a coherent patent system. Although the United States proved eager to develop new forms of technology, it espoused, for the moment, a republican culture that stressed communal responsibility and civic virtue over commercial acquisition and individualism. In the 1790s, Thomas Jefferson attempted to create a federal patent system based on republican principles, by which issues regarding

scientific achievement would be better settled between gentlemen and the success of an invention was guaranteed by that invention's superiority. More appropriately, he left states as the logical spheres in which to defend intellectual property rights. Because the patent clause of the U.S. Constitution provided only vague guidelines for the protection of intellectual property, American inventors defended their interests at the regional level through state-granted monopolies.

It is important to note that inventors such as Fitch and Rumsey only reluctantly forged alliances with state leaders to protect their inventions. Both men initially petitioned both national political figures and Congress for support in much the same way that a medieval courtier might have pursued a European monarch for letters patent. They learned to their misfortune that Washington, Franklin, and Jefferson possessed neither the authority nor the mindset of an Elizabethan ruler. The federal patents Fitch and Rumsey secured were essentially worthless in the unregulated economy of the 1790s. So in addition to forming steamboat companies and securing state monopolies, Fitch and his contemporaries turned to newspapers, brochures, presentations at scientific societies, and direct demonstrations to cultivate investors and customers. Even if they remained unaware of the effects of their larger actions, Fitch and Rumsey helped popularize steam travel and monopolies. John Fitch's autobiography served as a cautionary reminder to future steamboat entrepreneurs that scientific brilliance alone was not enough to ensure success in the early United States. Future inventors would have to create personas as not merely clever inventors but also savvy businessmen and leading citizens concerned with the public good. Nevertheless, as the United States began to look westward with the advent of the Jeffersonian age, steamboats still appeared to be lucrative investments in which to risk one's efforts and reputation. By the 1790s, other steamboat enthusiasts, including Robert R. Livingston, John Stevens, and Nicholas Roosevelt, had begun to study Fitch's methods in the hopes of succeeding where he had failed.⁶²