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The Barbed Wire Invention: An External Factor Affecting American Legal Development

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I. INTRODUCTION

The works of founders of states, law-givers, tyrant-destroyers and heroes cover but narrow spaces, and endure but for a limited time; while the work of the inventor, though of less pomp, is felt everywhere and lasts forever. Francis Bacon¹

The law prescribes rules, or modes of conduct, which society accepts as binding and which affect the actions of its members.² For example, the judicial and legislative rules established in the field of patent law may provide incentive for, or may discourage, the act of invention. Most commentary focuses on that aspect of the law: how the law influences conduct in our society.³

A converse aspect exists, however, whereby societal actions stand; external to the law force changes in the law. Thus, the law and society once or interact to produce mutual change. Although some writers have noted of our the converse aspect of the interaction,⁴ few develop the far-reaching quently effect—foreseen by Bacon—that

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¹ Bacon's words are quoted by *C.H. Greenstreet, History of Patent Systems*, in MAINLY ON PATENTS I (F. Liebesny ed. 1972).

² By "actions of society's members," I intend the widest possible meaning, to include economic, political, and intellectual acts.

³ Such commentary has recently reached epidemic proportions, prompted perhaps by the ongoing celebration of the Bicentennial of the Judiciary Act of September 24, 1789, 1 Stat. 73, and the upcoming bicentennial celebration of the two landmark laws Congress passed in 1790, the first Patent Act and the first Copyright Act. The celebration of the Judiciary Act, which created our present system of federal district and appellate courts, is under the auspices of the Judicial conference on the Bicentennial of the Constitution. The focus of that celebration, which includes banners, posters, exhibits, the construction of public buildings and monuments, books, films, mass distribution of literature, and a research grants program to foster scholarship, is to illustrate the overall effect of judicial decisions on American life. As part of the Patent and Copyright Acts' celebration, President Bush has issued a Proclamation commemorating the anniversary of the two laws and stating: "As our patent and copyright laws enter their third century, it is fitting that we recognize the role they have played in the scientific, economic, and cultural development of our Nation." Proclamation No. 6013, 54 Fed. Reg. 34,125 (1989) [hereinafter "President's Proclamation"].

⁴ See generally, Stein, *Uses, Misuses-and Nonuses of Comparative Law*, 72 Nw. U.L. REV. 198, 199 (1977). Writers note that various external factors affect the law: R. FERGUSON, *LAW AND LETTERS* (1984) (literature); P. MILLER, *THE LIFE OF THE MIND IN AMERICA* 3-95 (1965) (religion); W.

invention has on law. This paper focuses on the changes in rules of law fostered by one nineteenth-century invention, the barbed wire fence.⁵

As an introduction, the historical role of invention in the progressive nineteenth century is reviewed and the concepts of science and technology are distinguished. The facts surrounding the technological invention of barbed wire are then described in the context of Elting Morrison's four-step process of inventive change. With that background, the changes established and fostered by the barbed wire invention in five areas of the law—antitrust, property, tort, fencing, and patent law—are analyzed. That analysis supports the conclusion that even seemingly minor inventions, such as the improvement in barbed wire fencing, may have a widespread impact on legal development.

II. INVENTIONS IN GENERAL

A. *Progress*

As an innovator and leader, the inventor performs a most important function in society: the inventor holds the key to further progress.⁶ The ideal of the modern age is progress and the general acceptance of that ideal has caused the acceleration of invention in the last 100 years. That acceleration has been so swift that the outstanding characteristic of modern civilization is its complete depending on invention. Although we appropriate useful inventions as part of our culture with remarkable rapidity, inventions occur so frequently today – permeating every sector of the social system, including law – that we cannot give them much thought.⁷ Nevertheless, we must

NORDHAUS, INVENTION, GROWTH, AND WELFARE (1969) (economics); Grossfeld, *Geography and Law*, 82 MICH. L. REV. 1510 (1984) (natural environment of a country particularly its geography but including climate and population density); Grossfeld, *Sprache und Recht*, 39 JZ 1 (1984) (language).

⁵ This paper's relatively narrow focus on the effect inventions have on the law does not mean to slight their impact elsewhere. The economic effect of even minor inventions should not be and underestimated. Moreover, technological innovation is clearly an element in the progress of national culture and world civilization. See Rahn, *Industrial Property as an Element of National Industrial Strategy*, 23 INTELL. PROP. IN ASIA & THE PACIFIC 7 (World Intellectual Property Organization Dec. 1988); President's Proclamation, *supra* note 3 ("American inventors have left their mark in industry and everyday life").

⁶ Man realized, in early times, the great importance of the inventor. Greeks, Romans, and others showed their admiration; many of their gods were inventors. J. ROSSMAN, *THE PSYCHOLOGY OF THE INVENTOR* 2 (1931).

⁷ The former Commissioner of Patents and Trademarks, Donald J. Quigg, recognized the prevailing view of inventions and inventors:

Change, improvements, advancement have come to be so large a part of our being, that we question and wonder if they cease to go forward ever-accelerating rates. We have come to enjoy it as our right.

We don't often stop to seriously ponder how we got what [we] have. We accept our development with little sense of gratitude. But in light of our reflections, we can realize how vast is the obligation which we owe to the inventors of America. Not a meal we eat, not a paper we read or a television we watch, not a tool we use, not a journey we take but makes us a debtor of some American inventor.

D. Quigg, Address to the American Bar Association Annual Meeting, Section of Patent, Trademark, & Copyright Law (Aug. 5 to Aug. 9, 1989) *reprinted* in 38 PAT., TRADEMARK & COPYRIGHT J. 453 (BNA) (Aug. 31, 1989).

recognize that invention is the foundation of our culture – the basis for social and legal progress.⁸

B. *Inventing the Invention*

Society has not always given invention even the compliment of acceptance. Before the nineteenth century, society believed that God held all power; therefore, God limited mankind's accomplishments. The sense and acceptance of the human power which inventions could create was commensurately small.⁹ Because asking too much would have been impious, even the power of prayer had recognized limits! The inventions of the nineteenth century immensely increased, however, both the sense of human power and the acceptance of the inventions which provided that power.¹⁰

As the nineteenth century advanced, and the romantic movement receded, the century's ideology developed from three sources. First, the romantic movement was evident in religious revival, art, and political aspiration. Second, scientific advance opened thought. Finally, technological advance completely changed the conditions of human life.¹¹ The first two sources had prior origins.¹² What was peculiar to the century was its technology; the process of invention became quick, conscious, and expected.¹³ Many commentators called inventing the process, or method, of invention the greatest invention of the nineteenth century.¹⁴ As that new method took hold, it broke the foundations of old civilization.¹⁵ Today, inventive changes create enormous effects, effects which reach the legal system.

⁸ The author does not propose that invention alone is responsible for progress. Rather, an interactive process exists and "progress will not come through research, science, and invention alone. These are merely the loose strands of progress The genius of leadership and management in economic, political, and moral life [and, I would add, the law] must give meaning and use to scientific discovery. [Otherwise,] science alone can be the tool of tyranny." A. SMITH, PATENT LAW 1360 (1964) (quoting Charles Kettering in the Oct. 8, 1962 issue of *Newsweek*). Other authors also have cautioned that when knowledge is the monopoly of the few, tyranny results. See P. MILLER, *supra* note 4, at 269. Thus, inventions, without more, may actually obstruct progress.

⁹ See E. MORRISON, MEN, MACHINES, & MODERN TIMES 14-15 (1984).

¹⁰ Before the nineteenth century, society was told that faith could move mountains, but no one believed it. Society is now told that the atomic bomb can move mountains, and everyone believes it. B. RUSSELL, THE IMPACT OF SCIENCE ON SOCIETY 15 (1953).

¹¹ For the difference between science and technology, see *infra* text accompanying notes 16-20.

¹² Rousseau and the French Revolution, the first child of romanticism, were creatures of pre-nineteenth century history. The science of mechanics is based on three natural laws which were clearly stated for the first time by Sir Isaac Newton (1643-1717) and were published in 1686 in his *Philosophiae Naturalis Principia Mathematica* ("The Mathematical Principles of Natural Science"); those laws illustrate a prior scientific advance.

¹³ A. WHITEHEAD, SCIENCE & THE MODERN WORLD 141 (1954). On-rushing invention marked the 100 years that began in the mid-nineteenth century. Dreams made real by scientists and technologists revolutionized human existence in that 100-year period, so that life in the mid-twentieth century differed basically from life in Victorian England or in Lincoln's America. R. CLARK, THE SCIENTIFIC BREAKTHROUGH 10-11 (1974). One author has equated this "on-rushing" technology with national destiny. P. MILLER, *supra* note 4, at 312.

¹⁴ See, e.g., E. MORRISON, *supra* note 9, at 12; A. WHITEHEAD, *supra* note 13, at 141.

¹⁵ Even in 1899, society recognized that intellectual achievements distinguished the nineteenth century from all and any of its predecessors. It recognized the fundamental change in life and civilization. The century "must therefore be held to constitute the beginning of a new era of human progress." A. WALLACE,

C. Science versus Technology

Although both may affect the law, two types of knowledge are distinguishable. General knowledge, or science, alone cannot create technological knowledge, or invention. The inventor must use the principles of science to attain practical purposes and new industries.¹⁶ The patent system recognizes that difference: new and revolutionary laws of nature cannot be the subject of a patent. The patentee must teach the public how to use the idea or law.¹⁷

Although distinguishable, science and invention may have dual, parallel components. Philosophers often contrast the notions of normal science and scientific revolutions as complimentary components of science.¹⁸ Patent law similarly distinguishes two types of invention, the improvement and the pioneer invention.¹⁹ Normal science finds its counterpart in the improvement invention; the counterpart of a revolutionary scientific advance is the pioneer invention. The improvement invention (normal science) merely improves a prior invention (further establishes scientific knowledge). On the other hand, pioneer inventions (scientific revolutions) are distinct and epoch-making landmarks in human progress; they are revolutionary.²⁰ Nothing previously suggests or demands them, nor can an expert foresee them.

THE WONDERFUL CENTURY vii (1899).

¹⁶ To illustrate, consider that the ancients knew the force of steam. Until Watt, however, no steam engine existed. Similarly, scientists knew that carbon was a poor conductor of electricity but Edison used the principle to invent the electric light. Clerk Maxwell, one of the greatest theorists of all time and the father of the electromagnetic spectrum, noted the partnership between science and technology. "I am happy," he said on taking his first Chair at Aberdeen University, "in the knowledge of a good instrument-maker, in addition to a smith, an optician and a carpenter." R. Clark, *supra* note 13, at 9-10.

¹⁷ See J. ROSSMAN, *supra* note 6 at 19. Economists also distinguish the two types of knowledge. General knowledge for them, which includes laws of nature, liberal arts, language, and general principles, is useful to produce more knowledge. Technical knowledge is useful to produce more goods and is less useful in producing more knowledge. W. NORDHAUS, *supra* note 4, at 4. Philosophically, engineering has few heroes, unlike science, because the work has strict limits: engineering solutions generally are local and are limited by time, place, and singularity. Changes in instrumentation cause rapid obsolescence; thus, devices become extinct before ideas. E. MORRISON, *supra* note 9, at 111-12. Note that no clear boundary exists between the different types of knowledge.

¹⁸ For the seminal discussion, see T. KUHN, *THE STRUCTURE OF SCIENTIFIC REVOLUTIONS* (2d ed. 1970). Kuhn describes "normal science" as research based on past scientific achievements. He distinguishes achievements, called "paradigms," which are sufficiently unprecedented to attract a group of adherents and open ended to leave problems to resolve. *Id.* at 10. Science develops as one paradigm, or shared belief, transitions to another paradigm nearly instantaneously through a scientific revolution. *Id.* at 12. Normal science involves "mop-up work," answering the problems that a paradigm leaves behind based on the paradigm's principles. Scientific development requires both normal science and the revolution; normal research discovers cumulative anomalies until the existing paradigm becomes inadequate, thus creating a crisis and allowing a new, more-developed paradigm to displace the present paradigm during the subsequent revolution. When paradigms change, the scientist sees the world from a different perspective.

¹⁹ See J. ROSSMAN, *supra* note 6, at 3. Most inventions are improvements. Systematic research usually causes them; industrial competition usually prompts them.

²⁰ A revolutionary change, either inventive or scientific, creates hostility. Change produces social disorder and a human instinct exists to protect oneself-especially one's way of life. E. MORRISON, *supra* note 9, at 33-36; *The DeKalb County Manufacturer.- Barbed Wire Edition 1882* at 6 (C. Hunt ed. 1972) (available from the Land of Lincoln Barbed Wire Collectors Association, DeKalb, Illinois) [hereinafter cited as *DeKalb County Manufacturer 1882*]. Consequently, few relish a revolution, a dramatic change, in

The barbed wire invention is merely an improvement invention.²¹ If this paper can show that such an invention has a dramatic affect on the law, then major advances, recognized as causing social upheaval—such as Fulton’s steamboat, Goodyear’s vulcanization of rubber, Whitney’s cotton gin, Morse’s telegraph, Bessemer’s steel process—must also have an impact.²² Revolutionary scientific advances which cause new development, and promote technological advances creating new industries, will have a similar effect. Such technological advances inevitably foster social and legal changes because they create new social problems which require legal solutions.²³

III. THE BARBED WIRE INVENTION

A. *In the Beginning*

Following the Civil War, the farm-minded pioneer who nested in the Midwest and Southwest encountered a problem. Although farmers were by tradition fence makers, no native materials existed for the pioneers to build fences on the plains and prairies.²⁴ They found few stones for traditional stone walls.²⁵ The English (and later Americans) had used natural thorn hedges, which interestingly contain the principle of barbed wire, from time immemorial.²⁶ Vast spaces, growth periods, and replacement difficulty combined,

the field and strides are instead gradually made with wisdom and foresight. Advances come with well-known quantities and within a familiar environment. The revolutionary new invention (or scientific advance) threatens to change that environment and to remove control over the steady advance. E. MORRISON, *supra* note 9, at 146-49.

²¹ Although the United States Supreme Court denoted the barbed wire patent “important,” and even compared it to Whitney’s cotton gin, *Washburn & Moen Mfg. Co. v. The Beat ‘Em All Barbed Wire Co.*, 143 U.S. 275, 284 (1892), the barbed wire invention merely combined previously disclosed ideas to form an eminently practical end product. R. Baker, *NEW AND IMPROVED*. . . 15 (1976). *See also* R. CHOATE & W. FRANCIS, *PATENT LAW* 577 (2d ed. 1981) (citing the case litigating the patentability of the barbed wire invention, *Washburn & Moen*, for the principle that an improvement patent cannot rely on the basic or parent idea to support patentability).

²² One author calls Bessemer’s new method of making steel around 1856 “almost the greatest invention” because it had an incredible influence on the structure of society and government. E. MORRISON, *supra* note 9, at 124-25. The reader should note the cumulative effect of contemporaneous external factors upon the law. Although this paper focuses on one factor, the barbed wire invention, each factor becomes interwoven with others. For example, the absence of railroads in the 1870’s left the western prairie states without lumber for fences and created a demand for barbed wire. *See infra* text accompanying notes 27 and 52-54. States later required the railroads to fence tracks to protect the settlers that railroads had delivered; a demand for barbed wire existed. For a similar interaction between barbed wire and the Bessemer process, see *infra* note 18 and accompanying text.

²³ For example, note the social problems (e.g., the abortion issue) created by the technological advances in medicine which continue to push viability for unborn fetuses toward conception. The law has struggled, and continues to struggle, to accommodate such advances. *See Roe v. Wade*, 410 U.S. 113 (1973). *See generally* J. AREEN, P. KING, S. GOLDBERG & A. CAPRON, *LAW, SCIENCE & MEDICINE* (1984).

²⁴ *See H. MCCALLUM & F. MCCALLUM, THE WIRE THAT FENCED THE WEST* 7 (1965) hereinafter cited as H. & F. MCCALLUM] (this text provides an excellent history of barbed wire development in America). For another excellent history of barbed wire development in America, see S. Bigolin, *The Barbed Wire Saga* (Gurler Heritage Association, DeKalb, Illinois 1983).

²⁵ H. & F. MCCALLUM, *supra* note 24, at 7.

²⁶ *Washburn & Moen*, 143 U.S. at 277. Illinois’ papers were filled with advertisements for Osage sage orange hedge seeds in the early 1870’s. R. Phillips, *The Devil’s Rope*, 12 *ILINIWEK* 1, 4 (1974). In fact,

however, to thwart the usefulness of such hedges for the pioneers. Moreover, the cost and scarcity of suitable timber prohibited the pioneer from considering rail fences,²⁷ or tree trunk enclosures.

This problem continued to plague pioneer farmers as the 1870's began. Until 1874, wire fencing, another possible solution, generally was smooth-and unsuccessful.²⁸ The barbed wire invention of 1874 provided the answer to the fencing problem.²⁹ It also developed immediately into a source of wealth and furious litigation.³⁰ Western pioneers-ranchers and homesteaders-demanded fences that would protect them from outside dangers and shield their crops and live-stock. This continued demand maintained barbed wire fencing, and supported the manufacturers through their court battles.³¹ The demand also sustained barbed wire through the process of change.

B. *The Process of Change*

Elting Morrison describes a four-step process of inventive change. He includes as distinct steps: suitable environmental conditions to begin, appropriate agents to instigate, resistance to, and social accommodation to, the change.³² Because these steps correlate well with the development of the barbed wire invention, they form an outline for discussion of that invention. The final step of the process, accommodation, is not

according to the Report of the United States Board of Agriculture in 1871, Osage orange was third in prominence as fence material in Illinois—behind worm (a type of rail fence) and board fence. *DeKalb County Manufacturer 1882*, *supra* note 20, at 3.

²⁷ *Washburn & Moen*, 143 U.S. at 282; Kalez, *Bobbed Wire Benny*, in *THE CATTLEMAN*, Jan. 1972, at 50.

²⁸ H. & F. MCCALLUM, *supra* note 24, at 17. Wire had been recommended for fencing sixty years before; it was the subject of a patent as early as 1821. Smooth wire fence was subject to temperature changes, however, snapping in cold and sagging in heat. Moreover, animals pressed against it until the wire yielded. *DeKalb County Manufacturer 1882*, *supra* note 20, at 4.

²⁹ The advantages of barbed wire fencing were numerous: it was cheap and inexpensive to transport; was easy to erect and maintain; was nearly indestructible; resisted fire, wind, flood, animals, and trespassers; did not cause snow drifts or harbor weeds and vermin; was not stolen for fuel; did not decay; was light to handle; allowed weeds and grasses to be burned without harming the fence; and did not require fire insurance or a monitor. *DeKalb County Manufacturer 1882*, *supra* note 20, at 15. Figures of the barbed wire industry immediately following the successful 1874 invention of barbed wire show the rapid growth characteristic of a problem-solving invention:

YEAR	POUNDS OF BARBED WIRE MADE & SOLD
1874	10,000
1875	600,000
1876	2,840,000
1877	12,863,000
1878	26,655,000
1879	50,337,000
1880	80,500,000
1881	120,000,000

Id. at 5.

³⁰ For a discussion of the litigation, see *infra* text accompanying notes 76-80.

³¹ See R. CLIFTON, *BARBS, PRONGS, POINTS, PRICKERS, AND STICKERS* 3 (1970).

³² E. MORRISON, *supra* note 9, at 7.

considered separately; the entire focus of this paper is to investigate the legal accommodation to the barbed wire invention.

1. *Environmental Conditions*

The French patent to Grassin and Baledans, in 1861, first disclosed a barbed wire fence.³³ Nevertheless, before 1867 no American had conceived the idea and sought a patent for arming fence wires with pickets, spurs, iron points, spikes, sharp stones or bits of broken glass.³⁴ In July, 1867, however, William Hunt received a patent for placing spur-wheels on wire.³⁵ That crude device contained a clumsy and expensive flange, proved unsatisfactory, and never attained general use. Lucien Smith's later invention, although he patented before Hunt, first suggested a barb proper. Although that barb was in an imperfect form, it represented the state of the art in 1867.³⁶

An 1868 patent to Michael Kelly decidedly advanced the art. Kelly's diamond-shaped, metal barbs contained the idea which subsequently proved successful. The invention required hammer blows to fix the barbs in place, however, and that method prevented success.³⁷ Kelly failed to disclosed using the second twisted wire to lock the barb in position. In sum, little was done with any of these early patents, probably because the inventions patented were too complicated for successful manufacture.³⁸

This review of the state of the art indicates that the art was starting to change; the environment was prepared for innovation. Usually, no inventor gets very far ahead of the state of the art because the inventor cannot rise far above existing knowledge. Moreover, the Western pioneers' demand for a solution to their fencing problem, in a decidedly

³³ See E. BYRN, *THE PROGRESS OF INVENTION IN THE NINETEENTH CENTURY* 388 (1900).

³⁴ *Washburn & Moen*, 143 U.S. at 277. In fact, the Supreme Court noted, but dismissed on various grounds, contentions that early, nonpatented prior art even conceived of the barbed wire fence. *Id.* at 285-91.

³⁵ A chronological summary of the early American barbed wire patents follows. The source for this summary also provides pictures of the devices.

Date	Inventor	Patent No.
1867	Lucien B. Smith	66,182
1867	William D. Hunt	67,117
1868	Michael Kelly	74,379
1868	Michael Kelly	84,062
1871	Lyman P. Judson	118,135
1873	Henry M. Rose	138,763
1874	Jacob Haish	146,671
1874	Jacob Haish	147,634
1874	Isaac L. Ellwood	147,756
1874	Jacob Haish	152,368
1874	Charles Kennedy	153,965
1874	Luther & John Merrill	155,538
1874	Joseph F. Glidden	157,124

B. CLIFTON, *supra* note 31, at 365. See also J. Glover, *The "Bobbed Wire" VII Bible* (1986) (providing a short history of barbed wire and an extensive, illustrated history of related patents).

³⁶ *Washburn & Moen*, 143 U.S. at 278.

³⁷ *Id.* at 279.

³⁸ Davis, *Barb Wire Collection*, 19 WIRE & WIRE PRODS. 178, 178 (March 1944).

agricultural location and period (when fencing was the custom and often the law), ripened the environment.³⁹ Although the state of the art is ready, a considerable advance is unprofitable unless demand supports a forward movement.⁴⁰ These two factors—state of the art and demand—combined to create an environment favorable to change.

2. *Agents of Change*

Into this environment must step the agents of change, the inventor and entrepreneur.⁴¹ At the DeKalb County Fair of 1873, in Illinois, Henry Rose exhibited a wooden rail with metallic points. His exhibit created a sensation and spurred three inventors: a lumberman, Jacob Haish;⁴² a mechanical engineer and hardware merchant, Isaac L. Ellwood;⁴³ and a farmer beset with raising crops without adequate protection, Joseph Farwell Glidden.⁴⁴ History tends to emphasize the role of fortune or accident in invention (perhaps the human interest associated with accidental inventions creates that emphasis).⁴⁵ Although the three inventors fortuitously saw Rose's exhibit, they did not discover barbed wire by accident. Deliberate thought followed, aroused by the inventors'

³⁹ The problems with existing fencing, *see supra* text accompanying notes 24-31, created a demand for a better system of fence construction. In 1882, commentators noted that “an available and efficient system of protecting the fields in American husbandry has been a national problem for nearly a century.” *DeKalb County Manufacturer 1882, supra* note 20, at 5.

Morrison notes that a demand for a new product and a changing state of the art create an environment “ripe” for change. E. MORRISON, *supra* note 9, at 129-30. A demand certainly existed for a new fencing product in the early 1870's: “When men moved further West, they came to the prairies, where neither [stone nor trees] existed and shipping of timber made the cost prohibitive. So settlement of the vast plain awaited the making of a cheaper fencing material.” Davis, *supra* note 38, at 178. *See also supra* text accompanying notes 24-27.

⁴⁰ One author emphasizes demand:

There is a tendency in choosing significant patents to look for those which are, in some way or another, “firsts.” They may be the first to contain the germ of a new concept, but *no idea*, however far reaching and useful, *is of any value until* there is a method of applying it to meet a current market *demand* at a reasonable economic cost. So there exists a second concept of “first,” that of the first to be economically viable.

R. BAKER, *supra* note 21, at 15 (emphasis added).

⁴¹ The entrepreneur is, along with the inventor, an agent of change. For the story of the barbed wire entrepreneur, *see infra* text accompanying notes 66-83 and note 70.

⁴² In its 1908 pamphlet, *Haish Menu* (Barb City Reproductions), the Jacob Haish Company claims that Jacob Haish first experimented with barbed wire in 1872, that Haish's factory was the first successful commercial barbed wire factory in the world, and that the company manufactured Glidden's wire in 1908. For a background discussion of Haish and his company, *see DeKalb County Manufacturer 1882, supra* note 20, at 10-13.

⁴³ Ellwood has been described as a mechanical engineer, Kalez, *supra* note 27, at 50, and as a hardware merchant, H. & F. MCCALLUM, *supra* note 24, at 30. The author assumes Ellwood fulfilled both roles.

⁴⁴ For a description of how Glidden invented barbed wire, including the note that Glidden's wife spurred him to invent the wire to protect her garden from a recalcitrant cow, *see H. & F. McCallum, supra* note 24, at 31-33. *See also* Kalez, *supra* note 27, at 50, R. Phillips, *supra* note 26, at 1-8.

⁴⁵ The following statement is an example of that view:

[M]any times . . . men have exhausted their intellects and their lives in fashioning . . . the most abstruse processes and machinery without having contributed one dollar to the world's wealth or one throb of enjoyment to its happiness . . . and yet some of the most important and valuable discoveries, which have marked the progress of the arts and sciences, have been the effect of accident . . .

Barbed Wire Cases of 1882-84, Briefs, American Steel and Wire Company Records, American Steel and Wire Company of New Jersey (1928).

knowledge of unsuccessful wire fencing, the need for fencing, and the problem of few fencing materials in the area.⁴⁶

That knowledge, need, and problem prepared the inventors' minds for discovery. As Morrison notes, "fortune favors prepared minds."⁴⁷ Therefore, the inventors deserve credit even if history deems the invention accident; their minds solved a problem that others had observed without result. The element of the prepared, inventive mind of the agents is the last of three elements Morrison finds required for change: a favorable environment, fortune, and a prepared mind.⁴⁸

3. *Resistance to Change*

Once these elements combined to produce the barbed wire invention. Morrison's four-step process would anticipate resistance to changes caused by the invention.⁴⁹ Such resistance occurred in fact and barbed wire was not an immediate success. The South was dubious of any Northern inventions—despite the ten-year lapse after the Civil War. Many questioned whether barbed wire improved conditions in the West; they found barbed wire fences "the curse of the country."⁵⁰

Moreover, many special interest groups objected to barbed wire. Humanitarians felt that barbed wire was cruel because the "unnatural fencing" inflicted wounds on livestock that often caused death upon infection.⁵¹ They called for laws prohibiting the use of barbed wire fences, and introduced legislative bills to that effect.⁵² Lumbermen objected to the lost sales. Railroads, which expected to carry the lumber, supported that objection.⁵³ Cattlemen provided the strongest resistance to barbed wire, however, as evidenced by their famous dispute with the pioneer farmer.⁵⁴

⁴⁶ H. & F. MCCALLUM, *supra* note 24, at 61.

⁴⁷ E. MORRISON, *supra* note 9, at 128. Morrison would also note that each of the three inventors was on the margin of the farm machinery field. Lumbermen, engineer/merchants, farmers—none are constricted by the rituals or bound by the common practice of this field. *Id.* at 129.

⁴⁸ *Id.* at 130.

⁴⁹ Morrison is not the only author to anticipate such resistance. Another explains the omnipresent resistance as a characteristic of human nature: "It has been truly said that every new invention, that disturbs old usage, or by some special feature of its introduction invites hostile comment, is sure to have opposition, growing either out of prejudice or rivalry. This spirit seems to be inherent in the human breast and has manifested itself in all ages at the advent of every new idea" *DeKalb County Manufacturer 1882*, *supra* note 20, at 6.

⁵⁰ L. PELZER, *THE CATTLEMAN'S FRONTIER* 190 (1936).

⁵¹ H. & F. MCCALLUM, *supra* note 24, at 66. Cattlemen named the product "mean wire"; others called it "ornery wire." Kalez, *supra* note 27, at 50, 54. Roving bands of Indians occasionally rode into newly erected barbed wire fences in the dark; they named it "The Devil's Rope." R_ Phillips, *supra* note 26, at 2.

⁵² H. & F. MCCALLUM, *supra* note 24, at 67 n.8 (Texas and Connecticut (1879), and Vermont and Maine (1880), for example, considered such legislation).

⁵³ The railroads also feared that barbed wire would injure stock, rendering them liable to pay damages. *DeKalb County Manufacturer 1882*, *supra* note 20, at 6.

⁵⁴ For a full development of the rancher-farmer dispute, see *infra* text accompanying notes 88-99. An old Cowboy song presents the cattleman's view:

They say that Heaven
is a free range land
Good-by, Good-by, O fare you well;
But its barbed wire fence
for the Devil's hat band

Despite this resistance, barbed wire soon attained a widespread commercial use. The number of patents issued during the years following the successful invention in 1874 reflects that success.⁵⁵ Nevertheless, the barbed wire invention encountered the third step in Morrison’s process of change—resistance—before attaining success.⁵⁶

C. “The Winner”

Joseph F. Glidden’s patent number 157,124, issued on November 24, 1874, for an “Improvement in Wire-Fences,” was “The Winner”: it achieved success. Other inventors had developed barbed wire fences. The barbed wire art began practically, however, when Glidden developed his barbed wire and complimentary machine to make barbed wires.⁵⁷ Although Glidden’s closest competitors, Haish and Ellwood, had earlier patented barbed wire inventions, Glidden’s “means for preventing cattle from breaking through wire fences” provided the critical innovation.⁵⁸

Glidden’s patent claim was for “a twisted fence-wire having the transverse spur-wire D bent at its middle portion about one of the wire strands a of said fence-wire, and

And barbed wire blankets
down in Hell!

R. CLIFTON, *supra* note 31, at 3. Because such disputes often result when resistance to invention occurs, one author states that “[a]n invention is often a dream come true; sometimes it is a nightmare made real.” R. CLARK, *supra* note 13, at 9.

⁵⁵ A list of the number of barbed wire patents issued after the original 1874 invention follows:

Year	No. Patents	Year	No. Patents
1875	20	1887	9
1876	40	1888	11
1877	36	1889	6
1878	31	1890	6
1879	24	1891	21
1880	10	1892	18
1881	37	1893	11
1882	49	1894	5
1883	47	1895	2
1884	42	1897	3
1885	25	1943	1
1886	13	1959	1

R. CLIFTON, *supra* note 31, at 365-78. The surge during the years 1881-85 reflects an attempt by inventors to provide safer barbed wire in response to humanitarian complaints. For interesting photographs of these inventions, see Barbed Wire Photographs with Samples of Barbed Wire Patented in the United States Between 1874 and 1892 (28 plates) (on file in the University of Illinois Agricultural School library).

⁵⁶ Other obstacles to successful inventing exist in addition to resistance to change. One study found, in order of perceived importance by inventors, the following obstacles: lack of capital, lack of knowledge (invention is impossible because the inventor lacks a key piece of information), social prejudice (the “resistance” discussed in the text), legal difficulties, marketing problems, lack of time or facilities. J. ROSSMAN, *supra* note 6, at 162.

⁵⁷ See E. BYRN, *supra* note 33, at 388. Glidden patented his machine to make barbed wire along with P.W. Vaughan on December 8, 1874 (Patent No. 157,508). For a description of how that machine worked, see R. Phillips, *supra* note 26, at 6.

⁵⁸ See Appendix A, which contains a copy of the Glidden patent.

clamped in position and place by the other wire strand *z*, twisted upon its fellow, substantially as specified.”⁵⁹ The critical innovation was the method of holding the barb in place by using the second twisted wire to lock the barb.⁶⁰ Commentators recognize that the difference between Glidden’s fence and its contenders was slight. They also recognize, however, that the difference was sufficient to ensure the practical and commercial success that evaded the other inventors.⁶¹

Glidden’s invention combined a number of previously disclosed ideas to form a practical end product. That step created a “significant” and “important” patent;⁶² the use of “Glidden wire” rapidly swept across several continents.⁶³ Glidden’s small advance was difficult to patent because the novelty required for a patentable invention was hard to show. The United States Supreme Court case filed in 1885 by The Beat ‘Em All Barbed Wire Company, called “one of the interesting suits of American history,”⁶⁴ challenged the novelty of the Glidden patent and marked the last significant event in the barbed wire industry. The Supreme Court upheld Glidden’s patent, already trademarked “The Winner.”⁶⁵ Between 1874 and the Supreme Court’s decision in 1892, however, the barbed wire invention affected numerous areas of the law.

IV. BARBED WIRE & ANTITRUST LAW

A. The Entrepreneurs Succeed

The Washburn and Moen Manufacturing Company (Washburn Company), a Massachusetts company, was a successful manufacturer of wire. After Morse’s telegraph appeared, the company became the chief supplier of telegraph wire.⁶⁶ Interested in barbed fence wire but lacking a machine to make such wire by steam power, the president of the company, C.F. Washburn, contracted with H.W. Putnam to invent such a machine. The Vermonter succeeded, and the company purchased the rights to Putnam’s invention in 1875.⁶⁷ In 1876, Washburn visited DeKalb, Illinois to investigate the renewed activity in the wire business created by the Bessemer system in American plants. While in DeKalb, he noted the latest development in steel products—improved wire for fencing—and visited the prosperous Barb Fence Company, formed by Glidden and Ellwood, a customer of Washburn’s plain wire.⁶⁸

Washburn purchased Glidden’s interest in the Barb Fence Company and accepted Ellwood as a partner. Together, they formed a subsidiary of the Washburn Company, the partnership of I.L. Ellwood & Company, and set out to gain control of the barbed wire

⁵⁹ See Appendix A.

⁶⁰ A second innovation was the shape of the barb itself. Glidden used a piece of wire coiled about one of the fence wires. See Appendix A.

⁶¹ See, e.g., *Washburn & Moen*, 143 U.S. at 282; R. BAKER, *supra* note 21, at 36.

⁶² See R. BAKER, *supra* note 21, at 15 (significant); *Washburn & Moen*, 143 U.S. at 284 (important).

⁶³ See R. BAKER, *supra* note 21, at 15. This paper concentrates on the effects in America.

⁶⁴ Letter from Thos. H. Dodge (counsel for Washburn & Moen) to W.C. Gandy (counsel for Washburn & Moen), Leland Hotel, Chicago, Illinois, Feb. 13, 1884.

⁶⁵ H. & F. MCCALLUM, *supra* note 24, at 96.

⁶⁶ *Id.* at 17.

⁶⁷ *Thorn Wire Hedge Co. v. Washburn & Moen Mfg. Co.*, 159 U.S. 423, 425 (1895).

⁶⁸ H. & F. MCCALLUM, *supra* note 24, at 17. Note the interaction of several inventions, the Morse telegraph, the Bessemer process, and barbed wire. See *supra* note 22.

industry.⁶⁹ The entry of the Washburn Company as the entrepreneur was pivotal; the company provided the skill, experience, cash, and industrial know-how (unsurpassed in the American steel and wire industry) to create and support a large business.⁷⁰ The company purchased the Kelly product patent and Mitchell machine patents in 1876 from the Thorn Wire Hedge Company.⁷¹ When combined with the Ellwood and Glidden product patents, and the Glidden-Vaughn and Putnam machine patents, the Washburn Company held most of the foundation patents in the barbed wire industry. It began to sell barbed wire in 1876 and experienced astronomical success.⁷² History attributes much of the sales success to John “Bet-a-Million” Gates and his famous demonstration of the abilities of barbed wire, a demonstration which Gates conducted in San Antonio in 1876 and which overcame the criticism of many doubters.⁷³

Gates, furious at Ellwood’s failure to reward him with a contract in 1877, left the company and swore revenge. Haish was also inspired to compete with Ellwood’s company. Moreover, competitors could enter the barbed wire field easily. Led by Gates’ successful plant, which began operating in 1878, “moonshine manufacturers” produced unlicensed, or “free,” wire products at cut prices.⁷⁴ They refused to acquiesce in the Washburn Company’s patent rights and formed an association in 1879 for the purpose of resisting the Washburn Company’s efforts to stop patent infringement and to force competing manufacturers to take licenses.⁷⁵

Those manufacturers increased the litigation over the Glidden patent begun by Haish’s patent interference action in 1874.⁷⁶ In all, they brought twenty-eight lawsuits asserting “prior art” fences in an attempt to invalidate the Glidden patent, forcing the Washburn Company to spend \$50,000 defending the suits.⁷⁷ When the litigation finally ended in 1892, eighteen years after it had begun, the Washburn Company had discredited every prior art fence and had successfully defended the Glidden patent.

On the offensive, the Washburn Company began patent infringement suits against the competing manufacturers. By 1881, the company had succeeded in closing 139

⁶⁹ *Thorn Wire Hedge Co.*, 159 U.S. at 426.

⁷⁰ The Washburn Company was critical as the entrepreneur because Glidden and Ellwood suffered from many of the marketing obstacles which often undermine successful commercial development of an invention. *See supra* note 56.

⁷¹ *Thorn Wire Hedge Co.*, 159 U.S. at 426-28.

⁷² *See supra* note 29 for a table illustrating the growth of the entire barbed wire industry between 1874 and 1881. Much of that growth was supplied by the Washburn Company.

⁷³ *See Kalez, supra* note 27, at 54. San Antonio was, in 1876, a frontier town booming with business—especially the cattle business. Gates built a barbed wire corral in the heart of the city. His construction and showmanship, taunting and daring Texans (who prided their Longhorn’s ornery reputation) to test his wire with their meanest critters, also built suspense and interest. On the appointed day, cattle were driven into the corral amid much fanfare. Men attempted to arouse the animals with flaming torches. The barbed wire fence met the test, however, and sales of barbed wire spread as did news of the show. Apparently, the factory slogan, “Finest fence in the West. Light as air, cheaper than dirt, and stronger than whiskey.” was less effective than Gates’ demonstration. *Id. See generally* H. KOGAN & L. WENDT, *BET-A-MILLION: THE STORY OF JOHN W. GATES* (1948); H. & F. MCCALLUM, *supra* note 24, at 69-72.

⁷⁴ H. & F. MCCALLUM, *supra* note 24, at 79.

⁷⁵ *Thorn Wire Hedge Co.*, 159 U.S. at 430.

⁷⁶ An interference action is a proceeding to determine among (1) one or more patent applicants and one or more patentees, or (2) two or more applicants, claiming the same invention, which of the parties was the first inventor. J. LANDIS, *MECHANICS OF PATENT CLAIM DRAFTING* 527 (2d ed. 1974).

⁷⁷ H. & F. MCCALLUM, *supra* note 24, at 75.

factories.⁷⁸ In 1880, the Circuit Court of the United States for the Northern District of Illinois reached a final decision, upholding the Glidden patent and assessing damages, which affected about fourteen suits brought against alleged infringers.⁷⁹ And the effect of that judgment was incredible: it brought independent manufacturers to their knees before the company. Many of the manufacturers met, after the court had ruled, with Washburn and Ellwood in Chicago (in January and February of 1881). In settlement of their suits, the manufacturers assigned to the company twenty-nine of their own patents, paid damages for past infringement, and, in some cases, included a bonus. In return, the company issued over forty licenses allowing the manufacturers to continue production upon payment of royalties to the company.⁸⁰

Thus, the Washburn Company had forged a monopoly based on the foundation patents. The parallels to Morrison's development of the steel monopoly are striking.⁸¹ In analyzing the steel monopoly, Morrison found three influences which allowed the steel industry to fix prices and production in the last quarter of the nineteenth century. First, the railroads provided a known demand for steel. Because many states had laws requiring the railroads to fence their tracks, the barbed wire industry also enjoyed a known demand.⁸² Second, tariffs protected both industries from competition by excluding foreign products. Finally, a single association or company in both the steel and the barbed wire industries held the combined patents in the respective industries, thereby forcing all competing manufacturers to take licenses from the single monopolist. Consequently, despite times of economic hardship, both industries experienced soaring economic rewards.⁸³ The triad of tariff, pool, and known railroad demand brought the entrepreneur success.

D. Congress Reacts

Although Congress may not have reacted to a monopoly situation existing in only one industry, key inventions created monopoly conditions in a variety of industries by the late 1880's. The cumulative effect, which included that of the barbed wire monopoly, forced a change in the law. On July 2, 1890, Congress passed an act entitled "An Act to Protect Trade and Commerce Against Unlawful Restraints and Monopolies."⁸⁴ The legislative history shows that Congress specifically included the "Barbed Fence-Wire Trust" as an evil toward which that law aimed.⁸⁵

⁷⁸ *Id.* at 82.

⁷⁹ *Washburn & Moen Mfg. Co. v. Haish*, 4 F. 900 (C.C.N.D. Ill. 1880); *Washburn & Moen Mfg. Co. v. Haish*, 7 F. 906 (C.C.N.D. Ill. 1881).

⁸⁰ *Thorn Wire Hedge Co.*, 159 U.S. at 432; H. & F. MCCALLUM, *supra* note 24, at 83-84.

⁸¹ E. MORRISON, *supra* note 9, at 162-205.

⁸² The railroads also quickly overcame their initial distrust of barbed wire. By 1882, the railroads had "had hundreds of miles of the fence constructed, and [were] using no other material for new fences or replacing old ones. The fact that 105 railroad companies [were] using the Glidden wire alone, besides a large number that [were] using the other [types of barbed wire] makes it another striking proof of the superiority of barbed wire as a fence . . ." *DeKalb County Manufacturer 1882*, *supra* note 20, at 6.

⁸³ As one proponent of barbed wire said, "Barbed wire is good for three things. To keep things in, to keep things out, and to make money." Wichita Barbed Wire Collectors Association, *Inc.*, *Barbs & Snags*, at 13-14 (Dec. 1983).

⁸⁴ Sherman Antitrust Act of 1890, ch. 617, 26 Stat. 209 (codified at 15 U.S.C. §§ 1-7).

⁸⁵ 21 CONC. REC. 2466 (1890).

Congress sought to address a number of combinations in the form of trusts and conspiracies in restraint of trade found throughout the country. Moreover, Congress found that it was impossible for state governments to cope successfully with these trusts and conspiracies because their commercial character was such that their businesses extended throughout the states. Among these trusts Congress listed the Barbed Fence-Wire Trust, which had “assumed an importance and had acquired a power which [was] dangerous to the whole country.”⁸⁶ That trust controlled great power by its combined capital, and forced Congress to react.

V. BARBED WIRE AND PROPERTY LAW

A. *Ranchers Versus Homesteaders: “Its my Property. . . .”*⁸⁷

After the Civil War, livestock marketing became an important business as the demand for meat to feed a growing population increased.⁸⁸ The cattle owner rose to meet that demand.⁸⁹ To further the industry, cattle owners established the unwritten “law of the Open Range”: free access to grass and water over all lands.⁹⁰ Free use of unoccupied government land was the foundation of the cattle range industry, and fences had no place in that industry.

Fences were a prerequisite, however, to a homesteader’s successful migration onto the plains and the prairies.⁹¹ A barbed wire fence was the boundary sign of each new landowner, solved the water problem, and kept wild range animals and unruly cattle out.⁹² It also violated the law of the Open Range. Consequently, cattle owners regarded the homesteaders’ barbed wire fences with hostility. The drift-fence disaster during the winter of 1885, in which barbed wire killed sixty to seventy-five percent of many cattle herds, fueled the cattle owners’ hostility toward barbed wire fences.⁹³ Suddenly, in the

⁸⁶ *United States v. Trans-Missouri Freight Ass’n*, 166 U.S. 290, 319 (1897).

⁸⁷ Farmer and herdsman have never coexisted easily. The historian Josephus attributes the earliest enclosure to Cain, a farmer. Abel was a stock grower and herdsman. The farmer desires to protect possessions; the herdsman favors free range. See *DeKalb County Manufacturer 1882*, *supra* note 20, at 2.

⁸⁸ During the quarter-century after the Civil War, American population not only grew, it moved to the city from the country. “In 1860, less than a quarter of the American population lived in a city or town; by 1890, the figure had reached a third S. Thernstrom, *Urbanization, Migration, and Social Mobility in Late Nineteenth Century America*, in TOWARDS A NEW PAST: DISSENTING ESSAYS IN AMERICAN HISTORY 158, 158 (B. Bernstein ed. 1969). Thernstrom notes that, although foreign immigrants helped fill American cities, the immigrants from rural America were the more important source of urban population. *Id.* at 159. Because fewer Americans raised their own livestock, the importance of livestock marketing increased above the demand caused by the population growth alone.

⁸⁹ The demand for cattle was especially great because the buffalo became nearly extinct by 1870. E. DALE, *THE RANGE CATTLE INDUSTRY* 43 (1930).

⁹⁰ H. & F. MCCALLUM, *supra* note 24, at 10.

⁹¹ Settlers used the Homestead Act to its maximum. The government provided 160 acres of public land for any citizen who filed and met the Act’s requirements. Kalez, *supra* note 27, at 54.

⁹² Western range cattle were “wild,” having never been contained. That characteristic increased the injury rate of the cattle on homesteaders’ barbed wire fences.

⁹³ Cattle owners had constructed drift-fences, long, parallel lines of barbed wire, to keep cattle off depleted sections of the plains and to prevent them from crossing natural range boundaries and hazards such as ridges and coulees. Kalez, *supra* note 27, at 54. During the winter of 1885, a blizzard drove cattle, which refused to face the storm, against such drift fences. Many herds suffered huge losses as cattle suffocated or froze against the barbed wire fences. H. & F. MCCALLUM, *supra* note 24, at 132-33.

late 1880's, cattle owners adopted barbed wire as a tool, when ownership of land became desirable for establishing ranches. They needed range land to graze cattle and to establish claims to land that homesteaders would otherwise take.⁹⁴ Initially, the ranchers tried to obtain the land they needed through legal processes: they petitioned for legislation and proposed lease systems.⁹⁵ When those tactics failed, however, the ranchers resorted to force and fencing to secure range land. They used barbed wire to usurp public lands by simply enclosing the land which they intended to purchase, along with parts already owned, planning to establish large ranches.

As enclosure of public lands became widespread and encompassed immense areas during the 1880's, cases of illegal fencing crowded the ledgers of plain and prairie states.⁹⁶ The government administration initially maintained its "Open Range" policy and continued to support the somewhat-inconsistent, separate policy that a citizen might secure a parcel of land as personal property upon meeting minimum requirements.⁹⁷ The latter policy allowed ranchers legally to obtain growing amounts of public land. Whether legal or not, the ranchers' barbed wire fences often enclosed a homesteader's claim, a nester's planted field, or a prized water hole—causing frequent armed encounters.

The movement of fence-cutting evolved in the face of the government's legal policy and the ranchers' illegal acts in usurping public land.⁹⁸ Homesteaders organized to remove the ranchers' barbed wire fences, the rougher class gradually took control of those organizations, and the situation became tense. Although states passed laws addressing the illegal reaction to the ranchers' often-illegal action,⁹⁹ the national scope of the problem made such efforts ineffective.

Finally, barbed wire fences created enough friction to prompt a change in the law; they rendered the Open Range policy inadequate. The problem was whether the law should change to favor the rancher or the homesteader farmer. A key difference tipped the balance in favor of the farmer: whereas wire-cutting harmed private owners, the unlawful taking of public lands offended the United States government. Accordingly, the United States Land Commissioner reminded ranchers in 1883 that they were without rights to fence public lands. Commissioner McFarland stated that government would uphold settlers in destroying fences which prevented them from lawfully acquiring

⁹⁴ R. CLIFTON, *supra* note 31, at 3-4. The defendant in *Cameron v. United States*, 148 U.S. 301, 303 (1893), defended against charges that he usurped government lands on grounds that "if he had not the ability to maintain the fence, the land and water would be at once seized and appropriated by other persons"

⁹⁵ H. & F. MCCALLUM, *supra* note 24, at 175.

⁹⁶ In 1883, one rancher in Nebraska erected fences twenty to fifty miles long. Another report found barbed wire used to enclose 125,000 acres. *Id.* at 175.

⁹⁷ The United States Department of Interior established all rules governing public lands. It was responsible for preserving unclaimed areas which constituted the public domain. *Id.* at 171.

⁹⁸ One author lists nine causes for the fence-cutters' wars in Texas: severe drought, "desire for free grass and open range," "fear of monopolists," "inconvenience to travel," "unemployment of cowboys," "the old conflict between the nester and the cowman," "the fight between capital and labor," opposition to "landless gentry," and "damage to stock." Holt, *The Introduction of Barbed Wire into Texas and the Fence Cutting War*, 1930 W. TEX. HIST. ASS'N Y.B. 70-74.

⁹⁹ The Texas legislature required that all public roads be kept open and that barbed wire fences contain a gate every third mile. Although fencing without the consent of landowners became a misdemeanor, a \$50,000 appropriation sought to enforce emergency acts covering wire-cutting—made a felony. H. & F. MCCALLUM, *supra* note 24, at 165.

lands.¹⁰⁰ In further support of a new policy favoring agricultural settlers, President Grover Cleveland issued a proclamation, in 1885, which forbade enclosures on public land. President Benjamin Harrison's administration later continued that policy.¹⁰¹

Congress adopted the administration's policy almost immediately. Congress's statute of February 25, 1885 prohibited "construction and maintenance of enclosures on the public land,"¹⁰² and directly addressed large ranchers.¹⁰³ The penalty for an illegal enclosure, under both the Act and a Presidential Order, was removal of the enclosure.¹⁰⁴ Once again, the barbed wire invention forced a change in the law. The barbed wire invention had a direct role in causing a change in the law's policy regarding property in the public domain.

B. *Barbed Wire as a Nuisance: ". . . And I'll Do What I Want With It!"*

Although the effect of the barbed wire invention on the developing law of nuisance following the Civil War was less critical, an impact nonetheless existed. America had protected property to an extreme before the Civil War. The free lands and loose economic conditions which then existed promoted independent land use. The law did not check the individual use made of a particular land parcel. Thus, the principle of the inviolability of property ruled.¹⁰⁵

After the Civil War, however, urbanization and greater population densities made the fundamental impossibility of "absolute" property rights evident.¹⁰⁶ Use of barbed wire fences by property owners created a conflict with the rights of adjacent property owners' inconsistent use—in grazing animals, for example, that might suffer injury on the fence. As a dangerous device, barbed wire illustrates an incompatibility between

¹⁰⁰ SEN. EXEC. Doc. No. 54, 48th Cong., 1st Sess. 28, 30 (1883)

¹⁰¹ H. & F. MCCALLUM, *supra* note 24, at 170. Technological advances also helped the farmer consolidate a position as user and owner of land. For example, the railroad carried settlers, equipment, and provisions and was an important factor aiding the farmer. Again, inventions combined to foster change in the law. *See supra* note 22, note 68, and text accompanying notes 66-68.

¹⁰² 43 U.S.C. § 1061 (1986) (originally enacted as the Act of February 25, 1885, ch. 149, § 1, 23 Stat. 321).

¹⁰³ The Act "was passed in view of a practice which had become common in the western territories of enclosing large areas of lands of the United States by associations of cattle raisers, who were mere trespassers, without shadow of title to such lands, and surrounding them by barbed wire fences" *Cameron v. United States*, 148 U.S. 301, 305 (1893).

¹⁰⁴ Section 2 of the Act allows a court to order summary destruction of an enclosure found illegal unless the defendant removes it within five days of the court's order. 43 U.S.C. § 1062 (1986) (originally enacted as Act of February 25, 1885, ch. 149, § 2, 23 Stat. 321). President Cleveland similarly ordered all unlawful enclosures removed from public lands. Proclamation No. 3, 24 Stat. 1024 (1885).

¹⁰⁵ Philbrick, *Changing Conceptions of Property in Law*, 86 U. PA. L. REV. 691, 723-24 (1938). *See also* Cribbet, *Conceptions in Transition: The Search for a New Definition of Property*, 1986 U. ILL. L. REV. 1, 39-40 ("A concept of property with maximum private rights and minimal social responsibilities suited the mood and the reality of pioneers in a vast, underdeveloped continent . . .").

¹⁰⁶ *See* Cohen, *Property and Sovereignty*, 13 CORNELL L.Q. 8, 21 (1927) ("To permit anyone to do absolutely what he likes with his property . . . would be to make property in general valueless."); Cross, *The Diminishing Fee*, 20 LAW & CONTEMP. PROBS. 517, 518 (1955) ("it probably is beyond argument that the origin of limitations on an owner's freedom to do as he might wish with his land is in the proximity of other owners or occupants of land who would be affected by the acts of the particular owner"). *See also* Cribbet, *supra* note 105, at 42 ("As concepts of property have evolved, the balance has shifted from an excessive emphasis on individual rights toward a greater dominance of the social interest.").

neighboring land uses. That conflict further highlighted the impracticality of conceding one owner total discretion in the use of land without restraint or liability for harm caused. Therefore, barbed wire was one factor in the modern development of nuisance law and in the expansion of the police power to regulate property use.¹⁰⁷

A private nuisance is an unreasonable interference with use or enjoyment of a property interest in land.¹⁰⁸ The law distinguishes nuisance from trespass in that the former does not require a physical entry upon a plaintiff's land.¹⁰⁹ Because an owner who erects a barbed wire fence on his or her property does not invade a neighbor's land, that distinction was critical to plaintiffs who sought damages for barbed wire injuries. Under today's private nuisance law, a defendant is liable for invading a private use and enjoyment of land under three theories:

- (1) intent—the invasion is intentional and unreasonable;
- (2) negligence—the invasion is negligent or reckless; and
- (3) strict liability—the invasion is abnormally dangerous.¹¹⁰

Early barbed wire cases, which typically involved a plaintiff suing to recover for injuries suffered by plaintiff or plaintiff's livestock on defendant's barbed wire fence, helped to develop today's private nuisance law.

Although they did not refer to "nuisance" law, the barbed wire cases helped to establish the theory of nuisance as a field of liability. New Jersey recognized the right, and sometimes enforced the obligation, to fence. Courts found that the right, however, only included a "suitable and proper barrier."¹¹¹ Thus, they placed the duty on the fence owner to use property so as to avoid injury to neighbors. One court clearly stated the first principle of nuisance law, as applied to barbed wire injuries: no right exists to a barbed wire fence with characteristics that, in view of the natural habits and dispositions of the neighboring animals, would likely cause injury. In performing the duty to fence, the owner of land was obligated to consider the use made of adjoining land.¹¹²

Courts indicated their willingness to balance defendants' and plaintiffs' interests—the key to today's nuisance law. In some cases, they upheld the defendant's

¹⁰⁷ See generally E. FREUND, THE POLICE POWER (1904).

¹⁰⁸ W. PROSSER, J. WADE & V. SCHWARTZ, CASES AND MATERIALS ON TORTS 847 (7th ed. 1982) [hereinafter cited as W. PROSSER]. The law distinguishes between public and private nuisance, although the dichotomy is not a clean one. For a discussion, see C. DONAHUE, JR., T. KAUPER & P. MARTIN, CASES AND MATERIALS ON PROPERTY 1038 (2d ed. 1983) [hereinafter cited as C. DONAHUE].

¹⁰⁹ W. PROSSER, *supra* note 108, at 847. Under nuisance law, a defendant may not be liable for conduct which causes substantial harm if the defendant's conduct was "reasonable". C. DONAHUE, *supra* note 108, at 1039. Courts determine what conduct is reasonable by balancing the harm the conduct creates against the utility of that conduct. W. PROSSER, TORTS § 13, at 66-68 (4th ed. 1977); RESTATEMENT (SECOND) OF TORTS §§ 158, 163 (1965).

¹¹⁰ W. PROSSER, *supra* note 108, at 858.

¹¹¹ *Polak v. Hudson*, 10 N.J.L.J. 43, 44 (1886) (plaintiff sued for fatal injuries to a colt after it impinged a barbed wire fence erected by defendant between their lands).

¹¹² *Polak*, 10 N.J.L.J. at 45; see also *Sisk v. Crump*, 112 Ind. 504 (1887) (defendant may enjoy his own property as long as he does not injure another's property); *Gooch v. Boer*, 62 Mo. App. 206 (1895) (defendant cannot deprive plaintiff of plaintiff's use of his or her property; therefore, defendant's barbed wire fence violated duty defendant owed plaintiff).

right to enclose property within a barbed wire fence.¹¹³ When a plaintiff consented to a defendant's construction of the barbed wire fence, or bought property adjoining an already existing barbed wire fence, courts presaged the defense of "coming to the nuisance" and barred the plaintiff from recovery.¹¹⁴ They also provided a foundation for the attractive nuisance doctrine.¹¹⁵ Courts addressing barbed wire injuries provided the governing principles for today's question of whether contributory negligence is a defense to a nuisance action. When a plaintiff relied on a defendant's negligence, courts held that the plaintiff's contributory negligence barred relief.¹¹⁶ On the other hand, courts refused to consider a plaintiff's actions when they adopted a theory of liability approaching strict liability for barbed wire fences or when a defendant intentionally erected the fence as a nuisance.¹¹⁷ This dual nature of contributory negligence's role remains today.¹¹⁸

Finally, barbed wire fences helped to create the modern nuisance doctrine applying to spite fences. Then, and now, if a defendant erects a fence without any interest other than a desire to disturb the plaintiff, then the defendant is liable for injuries caused by the fence.¹¹⁹ The barbed wire cases helped to develop many of the tenets incorporated into modern nuisance law.

Readers may question whether the courts were not simply applying nuisance principles to cases involving barbed wire injuries, rather than developing the basic principles of an as-yet undeveloped legal field. Two facts support the proposition that the courts were developing the law, not merely applying it. First, the courts did not refer to "nuisance" law; second, such a body of law was not yet established in America. Courts were fashioning a new theory of liability to balance incompatible land uses: barbed wire fencing versus safely grazing animals.

¹¹³ *Godden v. Coonan*, 77 N.W. 852 (Iowa 1899) (disallowed claim for injury to horses kept in a pasture adjacent to neighbor's barbed wire fence).

¹¹⁴ *See, e.g., Pim v. Griffith*, 3 Pa. Co. Ct. 177 (1887) (because plaintiff consented to the barbed wire fence on the boundary between his farm and defendant's land, plaintiff could not recover for injuries to his colt; the court noted that absent plaintiff's knowledge of the fence and consent to it, plaintiff would recover). For a discussion of coming to the nuisance, see W. PROSSER, *supra* note 108, at 890-95; RESTATEMENT (SECOND) OF TORTS § 840D (1965).

¹¹⁵ The doctrine applies when a landowner creates a temptation before young children or animals that might reasonably create a danger. The law imposes a duty on the owner to protect the vulnerable classes from harm. *See* RESTATEMENT (SECOND) OF TORTS § 339 (1965). In *Sisk v. Crump*, 112 Ind. 504 (1887), the court imposed liability on a defendant when his barbed wire fence killed plaintiff's horse. Plaintiff owed a duty to protect because he knew horses were tempted to join other horses feeding in his lush pasture.

¹¹⁶ *See, e.g., Galveston Land & Improvement Co. v. Pracker*, 3 Tex. Civ. App. 261 (1893) (allowing a horse to run free is contributory negligence and bars relief; the horse escaped from plaintiff's lot and ran into defendant's barbed wire fence).

¹¹⁷ *See, e.g., Gooch v. Bowyer*, 62 Mo. App. 206 (1895) (plaintiff not guilty of contributory negligence in turning his horse loose in a pasture adjacent to defendant's barbed wire fence, although he knew of the fence).

¹¹⁸ *See* W. PROSSER, *supra* note 108, at 895-98.

¹¹⁹ *See, e.g., Boyd v. Burkett*, 27 S.W. 223 (Tex. Civ. App. 1894) (defendant had moved a barbed wire fence, against plaintiff's protest, so that it crossed the path that plaintiff's horse used to get water). For the modern rule, see W. PROSSER, *supra* note 108, at 868; RESTATEMENT (SECOND) OF TORTS § 829 (1965).

VI. BARBED WIRE AND TORT LAW

The term “nuisance” denotes a field of liability rather than a particular tort. The barbed wire invention also affected the related field of tort law by helping to develop the American rule regarding strict liability for abnormally dangerous activities. Before 1894, although some states left room for doubt, the mere maintenance of a barbed wire fence without proof of negligence was insufficient to charge the owner with liability.¹²⁰ Courts imposed liability for barbed wire fences to that point only on the basis of negligence.¹²¹

Subsequently, however, commentators began to consider barbed wire fences “unnatural” uses of an owner’s land.¹²² They recognized that such fences differed from ordinary fences and began to suggest that courts impose an increased duty of care on the owner of a barbed wire fence proportional to the increased danger.¹²³ In addition, contributory negligence should not be a defense, the commentators advised, to an owner’s liability.

Although some courts followed that advice,¹²⁴ the states differed and the law became uncertain. The consequent condition of flux forced state legislatures to act toward changing the law applicable to barbed wire fences, and many legislatures enacted statutes which imposed strict liability on a defendant who constructed a barbed wire fence.¹²⁵ Interestingly, the factors courts, legislatures, and commentators considered at the end of the nineteenth century in the context of barbed wire fencing, are evident today in the factors courts use to determine whether an activity is abnormally dangerous.¹²⁶

¹²⁰ LaMonte, *Barbed Wire Fences* 16 N.J.L.J. 105, 112 (1893).

¹²¹ See, e.g., *Guilfoos v. New York Cent. & Hudson River R. R.*, 76 N.Y. 593 (1893) (barbed wire fence is not necessarily dangerous; it may or may not be dangerous depending on the circumstances); *Loveland v. Gardner*, 79 Cal. 317, 21 P. 766 (1889) (constructing a barbed wire fence upon property along a highway did not, of itself, render defendant liable for damages sustained when horses impacted the fence and died); *Sisk v. Chump*, 112 Ind. 504 (1887) (erecting a barbed wire fence itself not a tort); *Worthington v. Wade*, 17 S.W. 520 (Tex 1891) (although a man was killed when thrown from a horse onto a barbed wire fence, such a fence constructed even near a public road was not negligent; such fences are in general use and “it is unreasonable to suppose that our own people would erect them . . . if they were essentially dangerous.”).

¹²² See *supra* text accompanying note 51. The seminal case establishing strict liability for a “nonnatural use,” as opposed to a natural use, of land is *Rylands v. Fletcher*, L.R. 3 H.L. 330 (1868). The American trend is to follow that English decision. W. PROSSER, *supra* note 108, at 717. Whether a use is nonnatural depends upon the character of the activity and the place of the activity. *Id.* at 716. Thus, barbed wire might be nonnatural in urban New York City but natural on the plains of Iowa.

¹²³ LaMonte, *supra* note 120, at 108.

¹²⁴ See, e.g., *Gooch v. Bowyer*, 62 Mo. App. 206 (1895) (defendant violated a duty merely by constructing a barbed wire fence; further, the defense of contributory negligence is inapplicable); *Siglin v. Coos Bay, R. & E. R. & Nav. Co.*, 56 P. 1011 (Or. 1899) (contributory negligence inapplicable).

¹²⁵ See, e.g., *Buckley v. Clark*, 21 Misc. 138 (N.Y. Co. Ct. 1897) (the New York Laws of 1894, chapter 755, prohibited the use of barbed wire to construct or to repair fences; therefore, defendant was liable for injuries to plaintiff’s horse caused by defendant’s use of barbed wire to repair a fence); *Siglin v. Coos Bay, R. & E. R. & Nav. Co.*, 56 P. 1011, 1013 (Or. 1899) (HILL’S ANN. LAWS OR. § 3461 required barbed wire fences to have a board or pole; when defendant did not comply with that statute, contributory negligence of plaintiff was inapplicable, otherwise courts would violate purpose of statute).

¹²⁶ The factors include the existence of a high risk of harm, likelihood of great harm, inability to eliminate the risk, the extent to which the activity is a matter of common usage, the appropriateness of the activity to the location, and the balance of the activity’s value against its danger. RESTATEMENT (SECOND) OF TORTS § 520 (1977).

VII. BARBED WIRE AND FENCING LAW

The fencing problem is the most dramatic example of how the barbed wire invention forced a change in the law. Under the common law of England, adopted in early America, the owner of cattle had to “fence in” animals to avoid liability for their trespass. American courts and legislatures soon abrogated the common law rule and required a land owner to “fence out” neighboring animals as a condition precedent to a damage claim for injury caused by trespassing animals. The advent of barbed wire was an important factor which caused reversion back, in many jurisdictions, to the original, common law rule.

A. Common Law: Fence In

At common law, the owner of animals had a duty to restrain them from trespassing on the land of adjacent owners whether that land was enclosed or not.¹²⁷ If the animals’ owner failed to fence them in, that owner was strictly liable for injury caused by the trespassing animals.¹²⁸ Although the origins of that rule are obscure,¹²⁹ two reasons for the rule exist in a populous country such as England. First, the rule encourages the agriculture necessary to feed numerous mouths.¹³⁰ Second, a limited amount of pasture land required a rule prohibiting animals from running at large.¹³¹ American jurisdictions generally adopted the common law rule without question.¹³²

B. Abrogation and Fencing Out

The common law rule soon showed itself less suited, however, to the geographical conditions of the newly settled country.¹³³ This incompatibility was especially true in the

¹²⁷ J. INGHAM, *THE LAW OF ANIMALS* 258 (1900). For a general, historical discussion of the common law duty to fence and its scope, see G. WILLIAMS, *LIABILITY FOR ANIMALS* 203-35 (1939).

¹²⁸ W. PROSSER, *supra* note 108, at 705-06; Grossfeld, *Geography and Law*, 82 MICH. L. REV. 1510, 1516 (1984) (previously cited in note 4).

¹²⁹ Some commentators attribute the rule to the fiction that owners were responsible for the actions of their animals because they were identified with them. See W. PROSSER, *supra* note 108, at 705. Other commentators dispel that fiction and believe that strict liability for mere escape was an anomalous extension of liability for intentional trespass in which the owner placed the animals on plaintiff’s land. G. WILLIAMS, *supra* note 127, at 127-34.

The historic function of the fence as a defense against outside foes (“fence” itself is a contraction of “defence”) suggests that the ancient custom was to enclose fields to keep animals out, rather than enclosing pastures to contain livestock. H.&F. MCCALLUM, *supra* note 24, at 7. Somewhere around the middle of the fourteenth century, courts established the common law rule. W. PROSSER, *supra* note 108, at 705.

¹³⁰ The effect of the centuries-long enclosure movement was to cause the slow but cumulatively startling agricultural revolution of the seventeenth and eighteenth centuries. In his celebration of the Bicentennial of the United States Constitution, Lieberman discusses the possible reflection of that movement on the framers’ work. J. LIEBERMAN, *THE ENDURING CONSTITUTION* 330-31 (1987.). Certainly, the framers of the Constitution were fundamentally concerned with property rights.

¹³¹ J. INGHAM, *supra* note 127, at 259; Grossfeld, *supra* note 128, at 1516.

¹³² For a collection of state cases establishing the common law rule, see J. INGHAM, *supra* note 127, at 259-65. For a discussion of the types of animals subject to the rule, and an exception to the rule for animals being driven, see W. PROSSER, *supra* note 108, at 706.

¹³³ The United State Supreme Court found the principle of liability of the cattle owner “ill-adapted to the nature and condition of the country at that time.” *Buford v. Houtz*, 133 U.S. 320, 328 (1890). The

western and southern states, in which established local custom allowed animals to roam at large. Had these states applied the common law rule, they would have prevented their citizens from using vast federal lands for grazing: the roaming animals would certainly have trespassed on privately owned land adjacent to the open range.¹³⁴ Moreover, these states lacked the building supplies to enclose large areas.¹³⁵

Accordingly, those states responded by abrogating the common law rule either by statute,¹³⁶ or by judicial decision.¹³⁷ As changed, the law precluded recovery for trespass unless the land owner could show that he or she had met the duty to fence.¹³⁸ That change forced the land owner to fence out straying animals.

Many states specifically adopted “fencing out” statutes applicable to the advancing railroads, a policy decision which increased the demand for fencing materials. Such statutes went so far as to hold the railroads liable for injuries which a fence would have prevented.¹³⁹ The railroads used barbed wire fences because they were the most economical, available, and adaptable of the prevalent fencing materials. This demand, caused by the legal requirement that railroads fence out animals or suffer liability, fostered the success of the barbed wire invention. As discussed below, the barbed wire

Supreme Court of Illinois addressed the common law rule in *Seeley v. Peters*, 10 Ill. 130 (1848). Although Seeley’s hogs damaged Peters’ wheat crops, the court refused relief because Seeley proved that Peters had inadequately fenced. “However well adapted the rule of the common law may be to a densely populated country like England, it is surely ill adapted to a new country like ours.” *Id.* at 142. The court concluded that the common law rule did not prevail in Illinois. *Id.* at 143. See also J. INGHAM, *supra* note 127, at 265. Dean, then Professor, M.H. Hoeflich asserted that English common law was inappropriate in America because it involved a system of scarce land and cheap labor. In America, land was available but few laborers existed. Therefore, the legal incentives that worked in England were ineffective in America. M. Hoeflich, Lecture at the University of Illinois (February 3, 1986).

¹³⁴ *Garcia v. Sumrall*, 58 Ariz. 526, 535, 121 P.2d 640, 644 (1942); see also *Lazarus v. Phelps*, 152 U.S. 81 (1894).

¹³⁵ See, e.g., *Buford*, 133 U.S. at 328 (“Owing to the scarcity of means for enclosing lands, and the great value of the use of the public domain for pasturage, [the common law rule] was never adopted or recognized as the law of the country”); *Seeley*, 10 Ill. at 142 (“This State is unlike any of the eastern states in their early settlement, because, from the scarcity of timber, it must be many years yet before our extensive prairies can be fenced.”).

¹³⁶ For a list of state “fencing out” statutes enacted by many prairie states, see Grossfeld, *supra* note 128, at 1517 n.47.

¹³⁷ For a collection of state cases deciding to abrogate the common law rule, see J. INGHAM, *supra* note 127, at 265-68. These cases indicate that courts will follow the English common law under state reception statutes only when that law is appropriate. W. PROSSER, *supra* note 108, at 707.

¹³⁸ “The owner of real estate does not use reasonable and ordinary care and diligence to protect his property from the intrusion of roaming cattle unless he encloses it with a lawful fence. . . . Rather, if he receives injury because he lacks a fence, the injury is caused by his own negligence.” *Union Pac. Ry. v. Rollins*, 5 Kan. 98, 104 (1869). See generally J. INGHAM, *supra* note 127, at 265; W. PROSSER, *supra* note 108, at 707.

¹³⁹ See, e.g., MO. REV. STAT. § 809 (1879) (required railroads to fence their roads; unless they did so, they were liable for injuries which a fence would prevent); Act of March 31, 1874, ILL. REV. STAT. 807, § 1 (1874) (required fencing by railroads) (current version at ILL. REV. STAT. ch. 114, § 53 (1983)). Courts often applied such statutes strictly. KAN. GEN. STAT. § 1252 (1889) required railroads to fence, in broad language. When a railroad failed to fence, it was liable for injury caused “in any manner whatever. . . . irrespective of the fact as to whether [the injury] was caused by the negligence of such railway. . . .” A Kansas court held one railroad liable when plaintiff’s horse was frightened by the railroad and ran into a barbed wire fence which ran *perpendicular* to the railroad! *Missouri Pac. Ry. v. Gill*, 49 Kan. 441 (1892).

invention, in turn, forced the law to change once again, reverting back to the common law rule. Thus, the co-mingling of two, contemporaneous, technological advances (the railroad and barbed wire) and the law prompted a circular, action-reaction development.¹⁴⁰

C. *Barbed Wire and Fencing In*

Commentators agree that barbed wire played a decisive role in the development of the West.¹⁴¹ The advent of barbed wire also made fencing out statutes feasible; only barbed wire fences could cover the large areas abundant in the West. Those statutes required the farmer to fence out the ranchers' cattle at the same time ranchers began to usurp large tracts of land by fencing. Therefore, the legal requirements and availability of barbed wire created a "race to fence" which heightened the conflict between ranchers and homesteaders.¹⁴² In response to that conflict, many states reverted to the common law "fencing in" rule, either by statute,¹⁴³ or by judicial decision.¹⁴⁴

Barbed wire was not alone responsible, of course, for these changes in the law. The public and governmental attitude toward pasture land and farm land was changing.¹⁴⁵ As the population increased, the country became more settled.¹⁴⁶ Finally, other technological advances interwove with the invention of barbed wire to change the law. The mutual development of the railroads and of barbed wire is noted above. Similarly, concurrent development of the iron windmill allowed settlers to pump water wherever they needed it. As a result, fences no longer blocked access to water and an important obstacle to fencing was removed.¹⁴⁷ In sum, although barbed wire alone did not cause the fencing laws to change, Glidden's invention was an important instigator.

VIII. BARBED WIRE AND PATENT LAW

Readers might question why this paper includes a section addressing the effect of barbed wire on patent law. They may believe that all patented inventions affect, in some sense, this field of the law. That belief is unfounded: the vast majority of patents affect neither society nor the law. Most patented inventions represent small advances in obscure fields and go unnoticed by either society or by the courts. In contrast, Glidden's barbed wire invention did not suffer obscurity; rather, it was one of those rare inventions that proved so useful as to deserve public acclaim. Unfortunately for the Washburn

¹⁴⁰ See *supra* note 22. Ironically, the same railroads that originally objected to barbed wire because it undermined their lumber business, see *supra* text accompanying notes 52-54, now became its chief supporter during the 1880's and 1890's. See *H. & F. MCCALLUM*, *supra* note 24, at 196.

¹⁴¹ See, e.g., *R. CLIFTON*, *supra* note 31, at 3 (as important as the revolver, the repeating rifle, and the windmill); *Kalez*, *supra* note 27, at 50 (as important as the Pony Express and the Colt 45).

¹⁴² See *supra* text accompanying notes 88-99.

¹⁴³ In 1867, Illinois passed its "herd law," one of the earliest statutes of that type, which prohibited horses, cattle, swine, and other animals from running at large. *R. Phillips*, *supra* note 26, at 3. See also, *ARIZ. CODE ANN.* § 24-502 (1983); *KAN. STAT. ANN.* §§ 29-101, 29-402 (1973).

¹⁴⁴ See, e.g., *King v. Blue Mountain Forest Assn* 100 N.H. 212, 123 A.2d 151 (1956).

¹⁴⁵ See *supra* text accompanying notes 100-01.

¹⁴⁶ See *supra* note 88.

¹⁴⁷ *Grossfeld*, *supra* note 128, at 1517.

Company, but fortunately for the developing patent law of the late nineteenth century, that acclaim prompted eighteen years of patent litigation.

A. Historical Perspective

Despite the constitutional provision empowering Congress to protect inventions,¹⁴⁸ the patent law was in disarray after the Civil War when Glidden patented his barbed wire invention. A brief historical review is necessary to place this muddled state of the law in perspective.

During the eighteenth century, American colonists began to show an inventive talent which has since become a trait of the national character.¹⁴⁹ Public sentiment so favored invention that the Constitutional Convention of 1787 passed the provision regarding inventions without dissent.¹⁵⁰ In his inaugural address, President Washington encouraged Congress to consider the subject of invention as a high priority,¹⁵¹ and Congress responded by establishing the National Patent System in 1790.¹⁵²

Under that system, as modified in 1793,¹⁵³ patents issued without examination to anyone who fulfilled formal requirements. Dissatisfaction with the system caused its repeal in 1836, and the fundamental principles of the present patent laws began to evolve.¹⁵⁴ After the Act of 1836, Congress amended the patent law with numerous enactments. The major changes occurred in 1837, 1839, 1842 and 1861.¹⁵⁵ Finally, the Revised Statutes of 1874 appeared—a codification of all United States Laws in force on December 1, 1873.¹⁵⁶ This brief history indicates the unsettled nature of the patent law when Glidden applied, in 1874, for a patent on barbed wire.

Much of this flux in the American legal policy regarding invention is attributable to conflicting external factors. After the founding fathers established a pro-invention policy, practical conditions and the influence of the clergy stunted American invention. The educated classes viewed science as an aesthetic form of entertainment without utility.¹⁵⁷ Utility was incidental, if it came at all, in their view. Moreover, because

¹⁴⁸ The Constitution provides that “Congress shall have 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.” U.S. CONST. art. I, § 8, cl. 8.

¹⁴⁹ L. SPRAGUE DE CAMP, *THE HEROIC AGE OF AMERICAN INVENTION* 16 (1961). This national talent finds its roots in the colonial struggle with England. England prohibited export of manufacturing machinery to the colonies; the mother country also prohibited communication of inventions overseas. The English view of America as a source of raw materials or partially fabricated items prompted such bans. That view also forced the colonists to become ingenious inventors. H. TOULMIN, JR., *INVENTION AND THE LAW* 9 (1936).

¹⁵⁰ H. TOULMIN, JR., *supra* note 149, at 10. Toulmin hypothesizes that the leaders in the Convention who were inventors, such as Washington and Jefferson, were responsible for the lack of dissent. *Id.*

¹⁵¹ Washington stated that he could not “forbear intimating to you the expediency of giving effectual encouragement as well to the introduction of new and useful inventions. . .”

¹⁵² Act of 1790, 1 Stat. 109, ch. 7.

¹⁵³ Act of 1793, 1 Stat. 318, ch. 11.

¹⁵⁴ Act of 1836, 5 Stat. 117, ch. 357.

¹⁵⁵ Federico, *Commentary on the New Patent Act*, 35 U.S.C.A. 1 (1954). For a detailed chronological summary of changes in the statutory patent laws, see H. TOULMIN, JR., *HANDBOOK OF PATENTS* 23-29 (1949).

¹⁵⁶ Federico, *supra* note 155, at 5.

¹⁵⁷ P. MILLER, *supra* note 4, at 275-78.

society considered useful results mere proof of man's benevolent nature, many inventors refused to patent their inventions and, instead, donated to society the benefits of their inventions. In fact, in 1829, the very term "technology" was unknown.¹⁵⁸

As America transformed from an agrarian society to an industrial economy and as technology demonstrated its benefits, however, society changed its views. On-rushing technology became equated with national destiny.¹⁵⁹ Glidden entered amid this transformation.

B. The Barbed Wire Patent Case

Cases during the middle decades of the nineteenth century developed, in detail, some of the principles that have ruled American patent law ever since.¹⁶⁰ The final important episode in the litigation over Glidden's patent, the United States Supreme Court case of *Washburn and Moen Manufacturing Company v. The Beat 'Em all Barbed Wire Company*,¹⁶¹ contributed to that development. Mr. Justice Brown, in delivering the opinion of the Court, used language which later courts followed in developing four patent law principles: the modern definition of patentable invention, the relationship between simplicity and patentability, and the effects of both prior unsuccessful trials and commercial success on patentability.

1. Definition of Patentable Invention

Congress requires that an invention, to be patentable, be useful, novel, and nonobvious.¹⁶² These statutory terms are clear; they encouraged much litigation, however, before the practical standard of what constitutes a patentable invention even approached the clarity of the definition.¹⁶³ Because the issue in *Washburn* was "whether there is involved in this device [Glidden's invention] sufficient of novelty to support a patent,"¹⁶⁴ the Supreme Court directly addressed, and clarified, the standard for Congress's novelty requirement.

Although Glidden had merely combined known parts and steps, the Court upheld his patent as a novel improvement. In doing so, the Court "laid down a general rule . . . that if a new combination and arrangement of known elements produce a new and beneficial result never attained before, it is evidence of invention."¹⁶⁵ The new rule provided a standard which remains critical to the definition of what constitutes a

¹⁵⁸ *Id.* at 287-89.

¹⁵⁹ *Id.* at 308-13.

¹⁶⁰ L. SPRAGUE DE CAMP, *supra* note 149, at 95.

¹⁶¹ 143 U. S. 275 (1892). The name "The Barbed Wire Patent Case" often denotes the United States Supreme Court decision. *See, e.g.*, R. CHOATE & W. FRANCIS, *supra* note 21, at 346.

¹⁶² These three requirements are set forth in 35 U.S.C. §§ 101-103 (1986) (section 101 requires utility, section 102 requires novelty, and section 103 requires nonobviousness). Note that many inventions are not patentable.

¹⁶³ Congress never provided a definition of novelty. Therefore, the courts had to develop a judicial definition of the novelty requirement stated in the patent statute. R. CHOATE & W. FRANCIS, *supra* note 21, at 169.

¹⁶⁴ *Washburn*, 143 U.S. at 277.

¹⁶⁵ *Id.* at 283.

patentable invention.¹⁶⁶ The barbed wire invention gave the Supreme Court the opportunity to establish this patent law rule.

2. *Simplicity and Patentability*

Congress requires that a patentable invention be “nonobvious”: an invention is not patentable if the differences between the invention and the prior art are such that the invention would have been obvious to a person with ordinary skill in the art at the time the invention was made.¹⁶⁷ Many courts held patents invalid as lacking inventive quality under this requirement because the disclosed invention was simple. These courts believed that anyone, and certainly a person skilled in the art, could conceive of a simple invention.

As with Congress’s novelty requirement, the Supreme Court in *Washburn* established a clear standard. Simply put, the Court stated that a simple invention may be the subject of a patent. The Court noted that the difference between Glidden’s invention and the prior art was “not a radical one, but slight as it may seem to be, it was apparently this which made the barbed-wire fence a . . . success.”¹⁶⁸ Moreover, the Court found it strange that Kelly did not think to substitute a coiled wire for his diamond-shaped prong. But because he did not, the Court refused to deny a patent to the man who had conceived of the simple improvement.¹⁶⁹ As with its novelty standard, the Court’s simplicity standard remains applicable today.¹⁷⁰

3. *Unsuccessful Trials and Patentability*

The Supreme Court further refined the definitional standard of the statutory term “nonobvious” in *Washburn*. In 1874, the barbed wire field represented a crowded art, one in which many inventors toiled in search of a successful solution to the fencing problem.¹⁷¹ When many workers overlook the solution achieved by the inventor after seeking long and hard—through unsuccessful trials—for results, the Court stated that proof of a patentable invention exists. The final step that turns a long search for results filled with failures into success evidences a nonobvious invention. Under its standard, the Court “sustained [Glidden’s patent] in favor of the last of a series of inventors, all of

¹⁶⁶ See H. TOULMIN, JR., *supra* note 149, at 31; J. LANDIS, *supra* note 76, at 167.

¹⁶⁷ 35 U.S.C. § 103 (1986).

¹⁶⁸ *Washburn*, 143 U.S. at 282.

¹⁶⁹ *Id.* at 283. Toulmin believes that simplicity indicates a greater, not a lesser, invention and would support patents for the most simple improvements. He reasons that (1) because the human mind proceeds from the complex to the simple, intricate inventions usually precede simpler and more successful inventions, (2) simple solutions are more difficult than complex solutions, and (3) simple solutions are more useful because they are cheaper, easier to maintain, and easier to operate. H. TOULMIN, JR., *supra* note 149, at 124-25.

¹⁷⁰ See, e.g., *England v. Deere & Co.*, 182 F. Supp. 133 (C.D. Ill.) *aff’d*, 284 F.2d 460 (7th Cir. 1960) (simplicity converted substantial failure of the twine-wire bailer into success and patentability upheld); see also R. CHOATE & W. FRANCIS, *supra* note 21, at 345 (“slight physical change can sometimes result in a patentable invention”).

¹⁷¹ See *supra* note 35 (six inventions were already patented on barbed wire before 1874). See also *Washburn*, 143 U.S. at 285-91 (describing other workers in the barbed wire field beginning in 1858 who had not patented).

whom were grasping to attain a certain result, which only the last one of the number seemed able to grasp.”¹⁷² The Court’s standard remains important today.¹⁷³

4. *Commercial Success and Patentability*

The courts today also consider certain “objective considerations” to resolve the issue of whether the patentee claims a patentable invention.¹⁷⁴ The Supreme Court in *Washburn* elevated the public’s reception of the invention to status as an objective consideration favoring patentability. After comparing the sales of Kelly’s patented device (3,000 tons per year) to that of Glidden’s barbed wire (173,000 tons in 1887),¹⁷⁵ the Court stated:

Glidden . . . gave [barbed wire] to the public by which it was eagerly seized upon, and spread until there is scarcely a cattle-raising district in the world in which it is not extensively employed. Under these circumstances, we think the doubts we entertain concerning the actual inventor of this device should be resolved in favor of the patentee.¹⁷⁶

The commercial success of an invention, or the lack of such success, remains an objective consideration of great importance in deciding cases of patentability.¹⁷⁷ Thus, barbed wire—the simple invention that attained commercial success after a crowded art had long attempted but failed to achieve a solution to the fencing problem—provided the Supreme Court with the opportunity to develop important changes in American patent law.

¹⁷² *Washburn*, 143 U.S. at 283.

¹⁷³ See, e.g., *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966) (long felt but unsolved need has relevancy as indicating nonobviousness); Note, *Subtests of “Nonobviousness”: A Nontechnical Approach to Patent Validity*, 112 U. PA. L. REV. 1169 (1964).

¹⁷⁴ *Graham*, 383 U.S. at 17-18 (“Such secondary considerations as commercial success. . . might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.”).

¹⁷⁵ *Washburn*, 143 U.S. at 282.

¹⁷⁶ *Id.* at 292. The Court also addressed the nonobviousness requirement directly: “Now that [barbed wire] has succeeded, it may seem very plain to any one that he could have done it as well. This is often the case with inventions of the greatest merit.” *Id.* at 283.

¹⁷⁷ See *supra* note 174. The role of objective considerations in deciding patentability, as defined by the Supreme Court in *Washburn*, has recently been buttressed. In 1891, Congress enacted the Evarts Act, creating the circuit courts of appeal to hear appeals from the federal trial courts. That Act profoundly limited the role of the Supreme Court in adjudicating patent cases; most cases deciding issues of patent policy were decided in the circuit courts and were not reviewed by the Supreme Court. Until the Supreme Court decided *Graham* in 1966, the circuit courts diverged in applying the Supreme Court’s view of objective considerations. Some viewed such considerations as merely “secondary”, relevant only when the issue of patentability was close or to “tip the scales” toward patentability. 2 D. CHISUM, PATENTS, § 5.05, at 5-387 (1989) (and cases cited therein). Congress created the United States Court of Appeals for the Federal Circuit in 1982, with exclusive jurisdiction over all appeals from judgments in civil actions for patent infringement. Since 1982, the Federal Circuit has revitalized the Supreme Court’s pronouncement in *Washburn* on the role of objective considerations. See, e.g., *W. L. Gore & Assocs., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1555, 220 U.S.P.Q. (BNA) 303, 314, (Fed. Cir. 1983) (objective considerations “may be the most pertinent, probative, and revealing evidence available”).

IX. CONCLUSION

When the United States Supreme Court termed the barbed wire invention “of the greatest merit”¹⁷⁸ and “importance,”¹⁷⁹ it did not realize the extent of its accuracy. The Court merely considered the invention’s impact on society.¹⁸⁰ This paper indicates that even a simple improvement invention can instigate fundamental changes in many areas of the law. Because scientific advances and other inventions may be more revolutionary than the barbed wire invention, their effects on the law may even surpass those effects which are associated with Glidden’s invention and are outlined above.

Moreover, technological advances are developed at a furious pace in modern society. Given the far-reaching influence that at least some of those advances will undoubtedly have on the law, it follows that legal principles will necessarily experience substantial changes in response. Accordingly, the legal profession will be challenged to assimilate the many changes anticipated. Further support for that conclusion exists: inventions comprise merely one societal act which affects legal development. Other external factors (e.g., literature, religion, economics, language) also force changes in the law, and many of those factors are now experiencing profound changes.

¹⁷⁸ *Washburn*, 143 U.S. at 283.

¹⁷⁹ *Id.* at 284.

¹⁸⁰ Even that impact is often overlooked. As barbed wire aficionados are known to sing:

When they wrote the history books, there’s one thing they overlooked,
As I’m driven by my conscience to inquire:
How could every mother’s son who wrote how the west was won
Fail to give sufficient credit to barbed wire?

REFRAIN:

OH, THEY TELL ABOUT THE INDIANS AND ABOUT THE WAGON TRAINS
AND THEY TELL ABOUT (KIT CARSON) AND THE REST.
YES, THEY TELL HOW CUSTER FELL, BUT THEY NEVER SEEM TO TELL
IT TOOK A MILLION MILES OF WIRE TO WIN THE WEST.

They tell about the mountains and they tell about the plains,
And that yellow stuff they found at Sutter’s Mill.
They tell us how the railroads on that great historic day
Joined their tracks on top of Promontory Hill.

(WELLS FARGO)

They sing about the tumbleweeds, they sing about Old Paint,
'Bout the cattle drives and how the dogies strayed.
Yes, they sing about wild animals like antelope and deer.
Why, they even sing about the place they played.

(JIM BRIDGER)

They tell about revolvers—all those six-guns made by Colt—
And of bad men with a forty-four for hire.
They speak of Wyatt Earp, but you seldom hear a chirp
About DeKalb and those good men that made barbed wire. (MATT DILLON)
They tell about McCormick, all those things his reaper did;
They attribute wonders to John Deere’s first plow.
But how about Joe Glidden who, with Ellwood, Haish, and Gates,
Built the first successful fence to stop a cow?

(WINCHESTER)

Barbs & Snags, *supra* note 83, at 11.

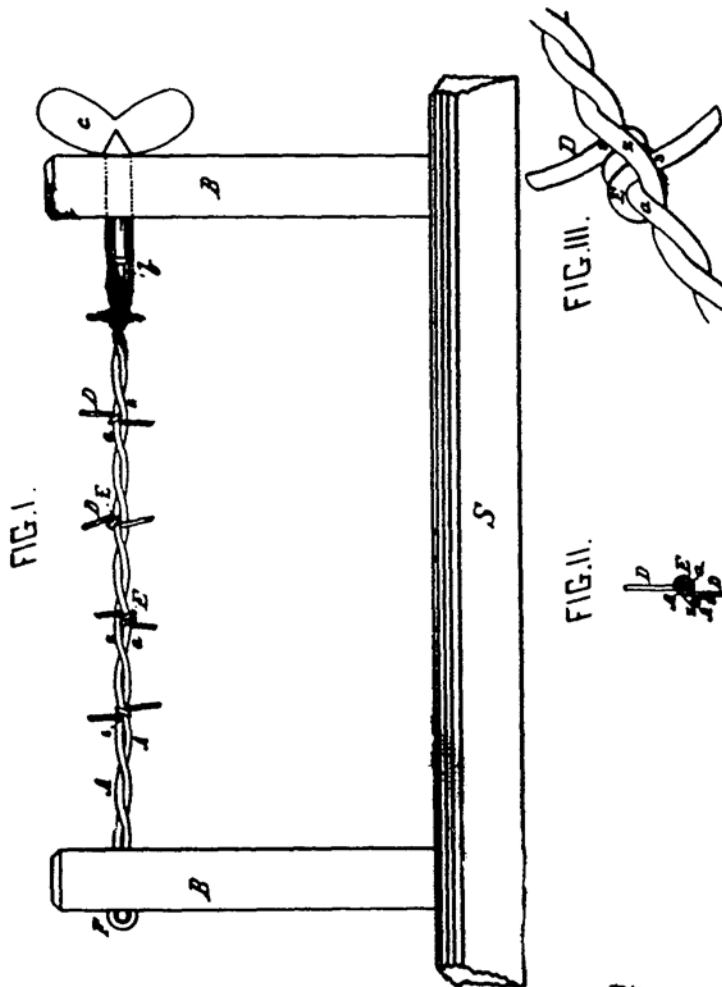
Whatever changes the law may experience in the future, however, the effects of Glidden's seemingly narrow advance on present legal principles are undeniably prevalent.

APPENDIX A

J. F. BLIDDEN
Wire-Fences.

No. 157,124.

Patented Nov. 24, 1874.



Witnesses:
J. H. Collins
G. G. Bellows

Inventor:
Joseph F. Blidden
By J. P. Chapman
Atty.

UNITED STATES PATENT OFFICE.

JOSEPH F. GLIDDEN, OF DE KALB, ILLINOIS.

IMPROVEMENT IN WIRE-FENCES.

Specification forming part of Letters Patent No. 157,124, dated November 24, 1874; application filed October 27, 1873.

To all whom it may concern:

Be it known that I, JOSEPH F. GLIDDEN, of De Kalb, in the county of De Kalb and State of Illinois, have invented a new and valuable Improvement in Wire-Fences; and that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 represents a side view of a section of fence exhibiting my invention. Fig. 2 is a sectional view, and Fig. 3 is a perspective view, of the same.

This invention has relation to means for preventing cattle from breaking through wire-fences; and it consists in combining, with the twisted fence-wires, a short transverse wire, coiled or bent at its central portion about one of the wire strands of the twist, with its free ends projecting in opposite directions, the other wire strand serving to bind the spur-wire firmly to its place, and in position, with its spur ends perpendicular to the direction of the fence-wire, lateral movement, as well as vibration, being prevented. It also consists in the construction and novel arrangement, in connection with such a twisted fence-wire, and its spur-wires, connected and arranged as above described, of a twisting-key or head-piece passing through the fence-post, carrying the ends of the fence-wires, and serving, when the spurs become loose, to tighten the twist of the wires, and thus render them rigid and firm in position.

In the accompanying drawings, the letter B designates the fence-posts, the twisted fence-wire connecting the same being indicated by the letter A. C represents the twisting-key, the shank of which passes through the fence-post, and is provided at its end with an eye, b, to which the fence-wire is attached. The outer end of said key is provided with a transverse thumb-piece, c, which serves for its manipulation, and at the same time, abutting against the post, forms a shoulder or stop, which prevents the contraction of the wire from drawing the key through its perforation in said post.

The fence-wire is composed of at least of two strands, a and s, which are designed to be twisted together after the spur-wires have been arranged in place.

The letter D indicates the spur-wires. Each of these is formed of a short piece of wire, which is bent at its middle portion, as at E, around one only of the wire strands, this strand being designated by the letter a. In forming this middle bend or coil several turns are taken in the wire, so that it will extend along the strand-wire for a distance several times the breadth of its diameter, and thereby form a solid and substantial bearing-head for the spurs, which will effectually prevent them from vibrating laterally or being pushed down by cattle against the fence-wire. Although these spur-wires may be turned at once around the wire strand, it is preferred to form the central bend first, and to then slip them on the wire strand, arranging them at suitable distances apart. The spurs having thus been arranged on one of the wire strands are fixed in position and place by approaching the other wire strands z on the side of the bend from which the spurs extend, and then twisting the two strands a z together by means of the wire key above mentioned or otherwise. This operation locks each spur wire at its allotted place, and prevents it from moving therefrom in either direction. It clamps the head of the spur-wire upon the wire a, thereby holding it against rotary vibration. Finally, the spur ends extending out between the strands on each side, and where the wires are more closely approximated in the twist, form shoulders or stops, s, which effectually prevent such rotation in either direction.

Should the spurs, from the untwisting of the strands, become loose and easily movable on their bearings, a few turns of the twisting-key will make them firm, besides straightening up the fence-wire.

What I claim as my invention, and desire to secure by Letters Patent, is—

A twisted fence-wire having the transverse spur-wire D bent at its middle portion about one of the wire strands a of said fence-wire, and clamped in position and place by the other wire strand s, twisted upon its fellow, substantially as specified.

JOSEPH F. GLIDDEN.

Witnesses:

G. L. CHAPIN,
J. H. ELLIOTT.

