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(Illustrated articles are marked with an asterisk.)

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Detailed table of contents for the supplement, categorized into sections like I. ENGINEERING AND MECHANICS, II. TECHNOLOGY AND CHEMISTRY, III. ELECTRICITY, LIGHT, HEAT, ETC., IV. GEOGRAPHY, ETC., V. ASTRONOMY, VI. HYGIENE AND MEDICINE, VII. AGRICULTURE, ETC.

THE PROPOSED NEW PATENT LAW.

On the 9th February the committee on the Revision of the Laws of the United States House of Representatives, on a motion to suspend the rules, succeeded in rushing through that body a bill "To regulate the practice in suits brought to recover damages for the infringement of patents."

The extraordinary haste with which it was put through was such that, we understand, the bill had not even been printed when it passed the House. The official text is as follows:

AN ACT to regulate practice in suits brought to recover damages for infringement of patent.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That hereafter in any suit brought in any court having jurisdiction in patent cases for an alleged use or infringement of any patented article, device, process, invention, or discovery, where it shall appear that the defendant in such suit purchased the same in good faith for his own personal use from the manufacturer thereof, or from a person or firm engaged in the open sale or practical application thereof, and applied the same for and to his own use and not for sale, if the plaintiff shall recover a judgment for five dollars or less, as damages, the court shall adjudge that he pay all costs of suit; and if the plaintiff shall not recover the sum of twenty dollars or over, the court shall adjudge him to pay all his own costs, unless it shall also appear that the defendant at the time of such purchase or practical application had knowledge or actual notice of the existence of such patent: Provided, That nothing contained herein shall apply to articles manufactured outside of the United States.

Passed the House of Representatives February 9, 1880.

Attest: GEORGE M. ADAMS, CLERK.

It certainly seems very ridiculous, after the many years during which some of the ablest members of both Houses of Congress have been unsuccessful in perfecting a patent bill which would meet all objections, to pretend that this measure has been brought forward, and thus "railroaded" through the lower House, for the "protection of farmers" from the extortions of patentees, which is now the principal point urged in its favor. "Farmers" are not generally credited with having the influence at Washington which can accomplish such results, and the manner in which the bill was passed, as well as the promptitude with which this justification of its provisions is furnished, carry conclusive proof, if any were needed other than that afforded by the bill itself, that the work is only one other "neat little job" of a well-paid lobby. Already before those most interested have had an opportunity to judge of the merits of the bill, a leading New York daily has some cut-and-dried arguments to urge in its support, put in what is judged to be a popular way, which may be summarized as follows: That sharpers have succeeded in imposing upon many people—especially farmers—by selling them what the seller did not own, or had no right to sell; that the patent laws are complicated, and common people cannot be expected to understand them, and that, therefore, the patentee should help make good to an infringer any loss which the latter may suffer from throwing away his money on swindlers.

The foundation of our patent system rests only on the constitutional provision that "Congress shall have power to secure to inventors for limited times the exclusive right to their discoveries." Congress, at an early day in our history, enacted laws in pursuance of this provision, which, although they have been many times changed, have always retained this distinctive feature: they give to the inventor the "exclusive" right to his inventions. Congress may constitutionally enact that patents shall hereafter be "limited" to a year, or six months only, or may repeal the patent law entirely; but plainly any right at all which a patent gives must, according to the Constitution, be an "exclusive" one, and all patents so far issued have "secured" such exclusive right, so far as the law is concerned. This bill would destroy the inventor's exclusive right, for it makes the conditions so favorable for infringers, and bears so inequitably upon patentees, that it would be utterly impossible for thousands of the latter to maintain their rights. That ignorance of the law is never a bar to punishment for its violation runs through all our jurisprudence, and every man is expected to know what the law is; but here we are, it seems, to have an exception, in the case of a man who wishes to use a patent without paying the patentee, for which this bill practically offers a premium. Another constitutional objection is also to be found in that provision which prohibits the passage of any law "impairing the obligation of contracts." The inventor obtaining a patent obligates himself to do, and must perform, many things, often at great cost, in order to fulfill the conditions imposed, and the law says he shall have in return certain benefits; when the patentee has fulfilled the conditions, and invested large sums of money, under the rights with which he has been legally vested, to arbitrarily deprive him of the benefits would be practically a direct violation of this constitutional provision.

That there have been thousands of people swindled—not only farmers, but men of all classes—in buying articles manufactured by infringers of patents, cannot be denied. One would think that the remedy for this evil should be sought in legislation to more certainly detect and more effectually

punish the criminal; but this bill cannot fail to act as a premium for those who have a turn for this sort of enterprise, as it virtually confiscates to their use the property of thousands of patentees. The law holds, in regard to all other kinds of property, that the purchaser is bound to exercise due care and discretion to see that the seller is the owner of or has the right to sell that which he offers, without which there can be no bona fide sale; but this bill not only relieves the purchaser of a patent from any obligation to exercise such care and diligence, but actually lays a fine upon the rightful owner for establishing his legal title in the courts. We do not for a moment believe that the bill in its present form can pass the Senate; but if it should be amended there, and go back again to the House, we trust it will then be fully discussed, with such ample explanation of its provisions as the great importance of the subject calls for; if this innocent measure "to regulate practice," etc., comes up again in this way, we shall have no fears of its being then rushed through so precipitately, notwithstanding the urgent reasons which the "Third House" may adduce for prompt action—on behalf of "the farmers," of course.

APPROXIMATE ECONOMY OF GAS AND ELECTRIC LIGHTING.

Taken by itself a cipher is an innocent thing and amounts to nothing; but its presence or absence in a series of figures sometimes makes an important difference in the summing of results. We presume that most of our readers must have noticed the errors resulting from the omission of ciphers in the article in our paper of February 21, under the above heading. As the subject is one of interest we think the best way is to republish the article, corrected as it should have been printed, and therefore give it as follows:

It is not in every place or position that the electric light can be employed in lieu of gas; but under some circumstances, for example, in spacious apartments, where large numbers of gas lights are used, the electrical method of lighting may now be adopted with satisfactory success. Under such conditions, and with gas costing the excessively high prices that we are accustomed to pay, the superior economy of electricity over gas has been conclusively settled on this side of the Atlantic. We might cite various examples, but for our present purpose one will be enough, to wit, the Riverside Worsted Mills, Providence, R. I., where the Brush electric lights have been in regular use for about one year past—long enough to determine approximately their actual expenses and merits.

In one portion of the above mills 1,000 gas lights were used, each of 15 candles intensity, yielding an aggregate of 15,000 candles, and costing \$12.25 per hour to run them, or 1/837 of a cent per candle per hour.

We are not informed as to the exact cost of the gas per 1,000 cubic feet, but we figure it to be \$2.45.

In lieu of the above 1,000 gas lights 80 electric lights were substituted, each of 2,000 candles intensity, yielding an aggregate of 160,000 candles, and costing 80 cents per hour to run them, or 1/1000 of a cent per candle per hour.

If we have not been misinformed as to the above estimates of costs and intensities, it would appear that gas lighting, at the mills named, was over a hundred and sixty times more costly than electric lighting, quantity of light produced being considered.

It may not be uninteresting briefly to compare the probable economies of Mr. Edison's new system of lighting with the foregoing results.

Mr. Edison's method has, to be sure, as yet only reached the stage of experiments. But it must be remembered that his trials have been made on an extensive scale, with full-sized electrical machines and apparatus, expressly with a view to show and determine what the practical introduction of the invention, wherever used, would accomplish. We have his authority for saying that the generous sum of one hundred thousand dollars in cash was placed at his free disposal, by his associates, to be used as he saw fit for these grand experimental demonstrations.

In a word, Mr. Edison's plan is to furnish small electrical lamps, each having the intensity, he tells us, of an ordinary gas light of fifteen candles, burning five cubic feet of gas per hour. He states that he gets ten lamps, or 150 candles, of light per hour per horse power of engine; and that each of his new electrical machines furnishes 750 candles of light and requires five horse power to drive it.

Applying the Edison system to the Riverside Mills and to the replacement of the 1,000 gas lights, we have the following approximate results:

Number of Edison lamps required, 1,000; number of Edison machines required to run the lamps, 20; engine power needed, 100 h. p. Approximate cost of the Edison plant, \$16,000. Approximate cost of running the same, delivering 15,000 candles of light per hour, including 6 per cent interest on the plant, \$1.66 per hour, or 1/1000 of a cent per candle per hour. This estimate allows no royalty to the owners of the patents. Thus the approximate cost of gas lights at the Riverside Mills is seven and a half times more than the same quantity of light would be under the Edison system. And the cost of the Edison system would, approximately, be twenty-two times more than the cost of the same quantity of electrical light as delivered by the present Brush machines. Side by side the fractions stand as follows:

Table comparing approximate costs of lighting per candle per hour: Gas lights (1/837 of a cent), Edison lights (1/1000 of a cent), Brush lights (1/1000 of a cent).