

Scientific American.

MUNN & CO., Editors and Proprietors.
PUBLISHED WEEKLY AT
NO. 37 PARK ROW, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS.

One copy, one year..... \$3 00
One copy, six months..... 1 50
CLUB RATES { Ten copies, one year, each \$2 50..... 25 00
{ Over ten copies, same rate, each..... 2 50

VOLUME XXX, No. 9. [NEW SERIES.] Twenty-ninth Year.

NEW YORK, SATURDAY, FEBRUARY 28, 1874.

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PATENT MONOPOLIES IN CONGRESS.

Another of the overgrown monopolies, which not only oppress the people but retard the progress of industry in this country, is now before Congress attempting to induce that body to give it another lease of life. Some forty years ago, an American residing in England, invented a machine for forming felt hat bodies, which he subsequently brought to the United States for the purpose of patenting. Owing to an informality, his application was rejected; but some years afterwards, the right was granted to Mr. H. A. Wells, who presented the same machine, modified by one or two minor changes. Since 1846, the association owning this patent have held a complete monopoly of the business, and, by refusing to license others to use the machine (except a few whom they bought off to prevent opposition to their last extension), they force all the manufacturers of the country to send their fur to the ring factories to be manufactured at ring prices. The actual cost of forming a hat body is but two cents, and the charge is from six to twenty cents, showing the enormous profit of from two hundred to one thousand per cent on every hat of the ten million and over yearly produced in the United States. The actual loss to the hat makers over what the cost would be, if allowed to manufacture their own hat bodies, is estimated at over 42 per cent, and against this the trade can do nothing. If any dealer complains, the ring refuse to make his hats, and his business is ruined. Several years ago, Wells died, and since then, for the benefit of his "poor" widow, who has only made \$111,000 out of the job thus far, two extensions were granted. Now, the ring comes before Congress again and asks for seven years longer, making thirty-five years in all in which to carry on their monopoly, and this in the face of the fact that the original form of machine patented by Wells, is not used and has not been for the past twenty-five years, but simply serves as a ground for litigation and the securing of damages for infringements. The hatters are resisting the attempt with all their influence, and they assert, that, with this oppressive tax abolished, they could not only produce more goods, and regain their lost foreign trade, but sell cheaper, and give their hands employment for the whole, instead, as is now the case, of only two thirds of the year.

These Wells patents, in common with those held by the sewing machine combination and the Woodbury planer ring, are infamous taxes on the people, and as such the country suffers for want of their abolition. We do not think the fault lies in our patent system, for the principles on which our laws are based are primarily the encouragement of the useful arts and the dissemination of knowledge concerning the same throughout the community. To foster their production upon the ground of expediency, and not of justice, limited monopolies are granted to the original and first discoverer, which, in accordance with the value of his invention, may yield him an ample remuneration for his thought and labor. Now if the inventor of a valuable article or process fails within a certain period to gain a just reward, then he may with justice be granted longer time; but if, on the other hand, he, or those representing him, succeed in obtaining a fair and adequate return during the lifetime of the patent, then there is clearly no reason for continuing the monopoly.

Mr. Saylor, of Indiana, has recently introduced a bill in the House of Representatives, the object of which is the suppression of the abuses we have pointed out, but the means taken are not such as will secure the desired result. It is provided that any article made under a single patent may be used, etc., by any one on payment of a royalty of 10 per cent on the market value, and that the user shall secure the patentee by a \$10,000 bond, filed in the Patent Office. The royalty on patents for improvements, or on inventions covered by two

or more patents, is to be fixed by the courts, and the same provision applies to copyrights. The trouble with this measure is that it strikes both ways; while benefiting the buyer, it injures the seller. It reduces the profits, perhaps, of the big corporations, but in like manner those of the smaller inventors whom it should protect. It puts into the hands of one man, the right to absorb the labor of another, carried on through years and at great expense, into a slightly improved device, giving the former individual all the profits, while the real worker must be content with a ten per cent royalty. Finally, apart from the crudity and ambiguity of its provisions (for on what basis is "market value," a fluctuating equivalent varying with locality, season, etc., to be estimated?), the law is open to the same objections as those relating to usury, as it arbitrarily restricts an individual's right to his personal property, and this we believe to be contrary to public policy, unless the need be imminent, clear and apparent, as in event of war.

We might urge other objections to the act—which we trust will not pass—but we dismiss it for the present to consider that which we believe to be the only true remedy to the existing difficulties. Mr. Saylor, in his argument, brings forward a mass of suggestive statistics; the india rubber industry pays 50 per cent on the capital employed, the cabinet organ business, 60 per cent, agricultural implements, 52 per cent. In seventeen months the capital invested in sewing machines doubles itself, besides paying all expenses; and finally comes the Wells hat manufacture, with the immense profits already pointed out. Now, with the full comprehension of these and other like cases: and there is no reason why a perfect understanding of the nature of these grinding *incubi* on the industries of this country should not be afforded us, for we, in common with other journals, have reverted to the matter again and again: why, we ask, do Mr. Saylor and his associates in Congress not strike directly at the roots of the evils and end them at once by refusing to extend their existences when the prescribed limits are reached? This hat body outrage has been fastened on the country for the last seven years by an innocent looking amendment tacked on the end of a bill on the last night of a session. Members failed to investigate, the measure passed, and the work was done. In other instances which we might mention, wealth is unsparingly used, opposition is bought off, professional talent employed, "poor" widows brought out as figure heads, Congressmen coaxed and cajoled, if not bribed, and, in fact, every art and trick of the lobby practised to ensure the passage of a desired bill—the object of which is simply to impose additional burden on the backs of the people.

The remedy needed is an enactment which will do away with these Congressional extensions, which will fix certain limits to the lifetime of a patent, subject to the discretion of the proper officials in the Patent Office. These limits should include one extension, to be acceded after careful investigation and for cause; but beyond the period so granted, not a day should be allowed. During twenty-one years, if the invention be of value, abundant remuneration can be gained; and monopolies of half a century's standing should be effectually abolished and rendered impossible.

SLIPPERY PAVEMENTS.

It takes but a short stroll along Broadway, during winter time, to convince one that, excellent as the Belgian pavement is in many respects, it nevertheless becomes, when well worn down by use and when covered with snow or ice or even with thin mud, a prolific cause of falls and injury to the heavily burdened horses constantly traveling over it. We know of no statistics which will show the average yearly amount lost through animals thus becoming maimed; but judging from our own observation and from the isolated fact that, quite recently, in passing once up and down Broadway on a single frosty day, we counted fifteen falls and four horses left by the roadside to die, it may be imagined that the aggregate must reach a considerable figure. The street, at times, becomes dangerous even to pedestrians in crossing, and hence doubly perilous for the horses from the insecure footing of their metal shoes. It would seem that the wooden pavements now on many of the side streets in this city, offer great advantages in point of security over roads of stone; but experience has so proved the unsuitability of the former, to meet the requirements of a street constantly alive with a heavy traffic, that their use on such thoroughfares as Broadway is practically out of the question. The subject is one to which we think the attention of inventors might be profitably turned, and a substantial pavement, combining the durability of stone with the supporting capability of wood, produced. In this connection, we notice that an investigation has been conducted in England, by Mr. William Hayward, engineer and surveyor to the Commissioners of Sewers of the city of London, which mainly consisted in observations as to the number of accidents befalling horses on asphalt, wood, and granite pavements. The investigations extended over fifty working days, and were principally made during the rainy weather of spring. The granite was found to be most slippery, the asphalt next so, and the wood the least. Considered in respect to moisture, asphalt was most slippery when merely damp, and safest when dry; granite most slippery when dry, and safest when wet; wood most slippery when damp and safest when dry. Wood, on the whole, is less slippery than either asphalt or granite in a marked degree, it being only inferior to granite when the pavements were wet, and the difference then between the wood and the granite being considerable. Of the accidents most obstructive to traffic, as well as most injurious to horses, asphalt had the greatest proportion, granite next, and wood least.

HERSCHEL, TYNDALL, AND DRAPER ON THE SUN RAY

Studying the solar spectrum, about the beginning of the present century, the elder Herschel passed a sensitive thermometer through the successive colors and observed that the greatest heating effect was not at all coincident with the brightest illumination. At the violet end of the spectrum, the heat was scarcely apparent. As the thermometer passed toward the red, the temperature slowly increased, the maximum appearing sometimes in the red, sometimes at a distance beyond the red, where no rays were visible.

The inference which he drew from these observations was that the heating rays were separate and distinct from the luminous rays and of a lower refrangibility. By the use of photographic papers, it was subsequently ascertained that the chemical action of the sun ray appeared to be greater toward the violet end of the spectrum, the maximum power apparently residing in the violet or ultra-violet radiations. Thus, as the rays of high refrangibility diminished in brilliancy, they seemed to increase in chemical power, much as the rays of low refrangibility increased in heating power with their lessened brightness. Hence arose the belief, which the scientific world has generally entertained of late years, that the solar radiation was triple in constitution, and so likewise the emanations from other self-luminous bodies. A favorite illustration of this view has been a cable woven of three strands, which were regarded as being separated by the prism into three independent yet slightly overlapping spectra: a visible spectrum culminating in the yellow; a heat spectrum at the red end and beyond the red; and a chemical spectrum chiefly in and beyond the violet.

In the spectrum produced by a prism of flint glass and prisms of highly refracting gems, the greatest heat was found below the red; with a crown glass prism it was associated with the pale red; with a prism filled with alcohol it appeared in the orange; while a prism of water gathered the heat chiefly in the yellow. Yet in spite of the evident connection which these facts would seem to point out between the position of the heat spectrum, so called, and the nature of the prism employed, no attention was paid to the suggestion, made by Dr. Draper as early as 1844, that the phenomena observed must be due not to any inherent property of the sun ray but to the prism, which crowded together the rays of the red end of the spectrum and greatly dispersed those of the blue and violet portion. In other words, the red end of the spectrum is warmest as the earth is warmest at the equator, not because the heat rays tend chiefly to that region, but because a greater number of solar emanations fall upon a given area there.

Perhaps the person who has been most influential in giving currency to Herschel's error is Professor Tyndall. In the eighth of his classic lectures on "Heat, considered as a Mode of Motion," he illustrates the subject with characteristic force and felicity. Using the thermo-electric apparatus devised by Melloni, he brings to bear upon the face of the pile the spectrum of electric light passed through a prism of bisulphide of carbon, and says: "I turn the handle and the slit gradually approaches the violet end of the spectrum; the violet light now falls upon the slit, but the needle does not move sensibly. I pass on to the indigo, the needle is still quiescent; the blue also shows no action. I pass on to the green, the needle barely stirs; now the yellow falls upon the slit; the motion of the needle is now, perhaps, for the first time visible to you; but the deflection is small, though I now expose the pile to the most luminous part of the spectrum. I will now pass on to the orange, which is less luminous than the yellow, but you observe, though the light diminishes, the heat increases; the needle moves still farther. I pass on to the red, which is still less luminous than the orange, and you see that I here obtain the greatest thermal power exhibited by any of the visible portions of the spectrum. The appearance, however, of this burning red might lead you to suppose it natural for such a color to be hotter than any of the others. But now pay attention. I will cause my slit to pass entirely out of the spectrum, quite beyond the extreme red. Look to the galvanometer; the needle goes promptly up to the stops. So that we have here a heat spectrum which we cannot see, and whose thermal power is far greater than that of any visible part of the spectrum. In fact, the electric light with which we deal emits an infinity of rays which are converged by our lens, refracted by our prism, which form the prolongation of our spectrum, but which are utterly incompetent to excite the optic nerve to vision. It is the same with the sun."

Subsequently Professor Tyndall, by means of a prism of rock salt, determined a heat curve in the region of the dark rays below the red, which, as he expresses it, "suddenly shoots upwards in a steep and massive peak, a kind of Matterhorn of heat, which quite dwarfs by its magnitude the portion of the diagram which represented the visible radiation." The same teaching was represented in the American lectures, the "Matterhorn" diagram occupying page 148 of Appleton's edition of the lectures. These lectures, it will be remembered, were delivered many times among us during the winter of 1872-3.

In the month of August, 1872, Dr. Draper published, in the leading scientific periodical of Great Britain, a memoir (a digest of which was shortly after given in the SCIENTIFIC AMERICAN) on the distribution of heat in the spectrum, in which he not only repeated his belief that the method employed by Herschel and subsequent investigators must necessarily lead to incorrect results, but furnished an overwhelming array of observations disproving them. As for Professor Tyndall's estimate of the proportions of heat on the two sides of the "extreme red," he held that "they were valueless for lack of care in determining the point of division." The red light shades off gradually, so that it is almost