

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, postage included.....\$3 20
One copy, six months, postage included..... 1 60

Club Rates:

Ten copies, one year, each \$2 70, postage included.....\$27 00
Over ten copies, same rate each, postage included..... 2 70

By the new law, postage is payable in advance by the publishers, and the subscriber then receives the paper free of charge.

NOTE.—Persons subscribing will please to give their full names, and Post Office and State address, plainly written, and also state at which time they wish their subscriptions to commence, otherwise the paper will be sent from the receipt of the order. When requested, the numbers can be supplied from January 1st, when the volume commenced. In case of changing residence, state former address, as well as give the new one. No changes can be made unless the former address is given.

VOLUME XXXII., No 17. [NEW SERIES.] Thirtieth Year.

NEW YORK, SATURDAY, APRIL 24, 1875.

Contents.

(Illustrated articles are marked with an asterisk.)

Air pump, mercury*	258	Kaolin in the United States	257, 260
Amalgams for filling teeth	257	Lens, radius of a (15)	257
Aniline inks	257	Life, duration of	259
Anatifa, the	259	Locking nut, improved*	258
Answers to correspondents	267	Lumber dog, improved*	258
Battery manipulation (20)	267	Magnetism and the aurora	262
Belts, flat and round (16)	257	Mind and health	255
Canal, the Suez	261	Morton, Professor, on color*	264
Centennial, Great Britain at the	260	Nickel precipitate, washing (23)	267
Centrifugal force (16)	267	Parasites in flies' tongues	260
Chinese patentee, a	261	Parbella, the recent (22)	267
Cistern, dimensions of round (7)	267	Patent decisions, recent	246
Colored confectionery	259	Patent laws, the British	259
Color, the modern theory of	261	Patents, American and foreign	248
Dam, closing a leaky (11)	267	Patents, list of Canadian	258
Earthquake indicator, another	267	Patents, official list of	267
Earth's diurnal movement, the (9)	267	Photography, dry plate	260
Electric light, the	260	Poisonous dress goods	259
Engine, lap on valve of (10)	267	Prairie chickens and grasshoppers	257
Engine power for planing (12)	267	Railway signals, pneumatic	245
Engines, high and low pressure (11)	267	Rapid transit in New York	256
Engines, the Great Eastern's (19)	267	Salt from brine, cheap	260
Files, the plague of	260	Secretary bird, the*	263
Get along, the way to	265	Sheep of California, wild	260
Gurney, Sir Goldsworthy	261	Shingle machine, improved*	262
Hammer, new tack*	259	Ship, the modern war	261
Horsepower (17)	267	Sun's orbit and rate of motion	260
House, doing up a	261	Sun's position at different seasons*	259
Ice, compressed	263	Tanning process, improved*	262
Ice, drifting of	262	Telescope lenses (1, 2, 3, 4, 5)	267
Impermeability of tissues*	258	Wardian fern cases, the*	263
Iron and steel, American	357	Workmen live, how American	265

IMPORTANT CHANGES PROPOSED IN THE BRITISH PATENT LAWS.

For several years past a discussion has been going on in England touching the amendment of the British patent laws. A Parliamentary Committee have examined witnesses; the press, the patent solicitors, the Society of Arts, and many experts have assisted in the discussion. The testimony has been carefully sifted, and a very large amount of ability has been brought to the consideration of the subject. The result of these labors has crystallized in the form of a Patent Law Reform Bill, lately introduced in Parliament, and passed without serious opposition through committee. Lord Cairns, the Lord Chancellor of Great Britain, the great gun of England, was the introducer and advocate of the bill, and opened the subject by the delivery of an oratorical broadside, two or three hours in length, the report whereof, in small type, nearly fills one of the large pages of the London Times except the *Thunderer*.

His Lordship gives some striking statistics concerning English patents, illustrates the prolific and, in some instances, amusing operation of the American system, and strenuously urges the necessity of the proposed amendments, which have for their object to suppress or check the granting of patents for inventions.

The existing patent law of England provides, in brief, as follows: Patents are granted to the first applicant, whether inventor or merely introducer. No official examination is made; but all patents are printed and accessible, thus enabling applicants to make their own examinations. The patentee enjoys the exclusive possession of his patent. No one may use it without his consent. He is not compelled to work it within any specific period. If the thing patented proves to be lacking in novelty or utility, the patent is good for nothing.

These provisions are admirable for their simplicity and practical excellence; but their beneficent capabilities are marred, and indeed almost suppressed, by the heavy payments demanded by the government for issuing and certifying the patent. The duration of the patent is 14 years, divided into paid periods of 6 months, 3 years, 3½ years, and 7 years. If the official fees attached to each period are not paid up, the patent terminates on the day of failure. The total official fees now charged are £175 sterling, or \$875, for a British patent of 14 years. The British patent extends over England, Wales, Scotland, Ireland, and the Channel Islands.

For the British colonies, some twenty separate patents are required, the average government charge for which is \$200 each; making, with the home patent, a total of \$5,000, as the government demand for a patent privilege of 14 years, for the States of Great Britain. We believe there is no other nation that imposes such heavy charges upon the inventive portion of its people, nor is there any patent-granting nation that, considering the ratio of population, issues so few patents as Great Britain.

But it appears that a further curtailment has become necessary. The Lord Chancellor, in his great speech, tells us that 4,300 patents are annually applied for in England, of

which one third are abandoned at the end of the first six months, and become null, by reason of the non-payment of the sealing fees, amounting to \$125. Seventy per cent of the remainder become null at the end of the third year, by non-payment of the tax of \$250. Twenty per cent of the surviving patents terminate at the end of the seventh year by non-payment of \$500 then due, leaving less than 700 patents per annum that actually run for 14 years; while the average total life of English patents, as deduced from the Lord Chancellor's statements, provisional patents included, is only a little more than four years.

To Americans, who are accustomed to the grant of thirteen thousand patents every year, each for the full term of seventeen years, the diminutive issues of Great Britain seem like a trifling affair. But to the mind of the Lord Chancellor an English patent is a big thing.

"You have granted in this country every year," he says, "the enormous number of patents I have mentioned, and what is the effect on the industry of the country? The manufacturer, in carrying on his regular course of trade, is hampered by owners of worthless patents." "I cannot imagine anything more serious to all the manufacturers of the country than that 4,300 drag nets, more or less, should be spread, every one of them curtailing, to some extent, the area of those manufactures, and every one of them exposing manufacturers to litigation, or perhaps to the payment of blackmail, if they would escape the irksome process of litigation for an alleged infringement of patent rights."

It is to remedy this bad state of things that the Lord Chancellor urges the proposed amendments. Throughout his long speech not a single word is to be found which encourages the inventor or recognizes his title to the favorable regard of my lords' countrymen. Instead of reducing the cost of procuring patents, and simplifying the method of obtaining them, the sole aim of the Lord Chancellor's bill is to reduce the number of patents granted by increasing the difficulties of their procurement, and subjecting the inventor to new and vexatious requirements.

The new bill provides as follows: Five new Commissioners of Patents are to be added to the number now in office. Certain examiners are to be appointed. Referees are also to be chosen. Examiners and referees are to consider all applications for patents that are made, and report to the Commissioners whether the application is a proper subject for a patent, whether the papers are correct, whether the invention is new, what it consists of, whether the patent ought to issue for seven or fourteen years, whether a patent ought to be granted at all. The law officers will then examine and report to the Lord Chancellor, who is to decide whether to allow or reject the case.

The applicant must declare himself to be the inventor; patents will not be granted except to the inventor. The patent may be revoked if the inventor fails to put the invention in operation within two years, or if the patentee refuses to grant licenses to persons who ask, on terms to be fixed by the Lord Chancellor. Government may use any patent, and make such payment as the Treasury chooses to allow. No appeals from the decisions of the Lord Chancellor. The fees remain about the same as at present.

The plain inference from the Lord Chancellor's expressions, and from the amendment he presents, is that England has no further use for the services of ingenious and originating men. Her manufacturers complain of them, and petition to have their patents suppressed. Men like Arkwright, a barber, the author of the spinning frame, who was so poor that he had to shave people in a cellar for a penny a head; men like Cartwright who, with his loom, almost built up Manchester; men like Watt, the poor instrument vender, whose steam engines furnish power for these complaining manufacturers; men like Stephenson, the poor stoker, and son of a stoker, who gave railways to Britain—the time has come, it appears, when men of this kind are not to expect further encouragement under British patent laws.

We do not propose to reason with the Lord Chancellor and his coadjutors upon the folly of such legislation. But we want their constituents to know that the American people regard the inventors of England as their benefactors, deserving of encouragement and honor. They cherish with deep reverence the memories of the long line of worthy Englishmen, humble, it is true, in family origin, who by their discoveries and inventions have filled the earth with new methods and appliances of industry, and given supremacy to their native land.

We are doing all that we can, as a nation, to encourage and stimulate original inventions in our midst. It is by industry and intelligence that we thrive. We therefore extend the hand of greeting to inventors of every clime. We say to them: Come hither with your new arts. They help to enrich us; they add to our national strength; they increase our moral power. Especially do we welcome inventors from the people of Great Britain, to whom we are allied by many ties. We speak their tongue, they are our kindred; from them our laws, our national existence, have sprung.

We acknowledge our indebtedness to the Lord Chancellor for spreading among his countrymen the intelligence that while it has become necessary to restrict and burden English inventors, they will find no burdens or restrictions in the United States. Here they will encounter few complaints against patents by manufacturers. The principal wail to be heard in this country is the cry of the manufacturer, asking inventors to study out new and practical things with which to occupy and task his machinery.

The Lord Chancellor will add to our obligations if he will again kindly announce in Parliament, and circulate the news widely in the British realm, that all Englishmen, although

denied at home, may freely obtain patents in the United States for the smallest inventions, provided they are new and useful; that patents are granted here for 17 years for the small sum of £7 sterling; that the patent covers the thirty-eight State and nine Territorial governments of the American Union; that an English patentee possesses here the exclusive control of his invention during the term of the patent; that he is not obliged to work his invention, or pay any taxes or annuities in order to preserve the life of his patent; that neither Government nor private individual can interfere, or use his patent without first obtaining his consent on his own terms.

In short, let it be everywhere made known that the government of the United States aims to encourage inventors and authors, by securing to them an absolute property in their inventions, whether great or small, for the term agreed upon in the patent. This is the one distinctive characteristic of the American patent law. It is this which gives value to our patents; and it is because they are valuable that so large a number are annually solicited.

A NEW MACHINE FOR REMOVING SNOW FROM STREETS.

The exceptionally severe season just gone by, with its heavy snowfalls and deep frosts, the remains of which have far from disappeared even yet in more northerly localities, has brought home, to the business community especially, the great need of artificial means for effectually preventing the impeding of thoroughfares by the rapid removal of snow and ice as fast as the same may form. Sweeping the snow from one part of the street on to another, or melting the same by the free application of salt, are common remedies, productive, however, of more evil than good; while the slow method of shoveling the snow bodily into carts, and thus removing it, costs, for a great street like Broadway, something like \$20,000 per mile per season. Various schemes for melting the deposit, by the application principally of superheated steam, have been proposed, and machines for that end devised and submitted to our city authorities; but up to the present time no practical tests of the proposed means, so far as we can learn, have yet demonstrated their suitability to the end in view. The street railway companies drive jets of steam down on their tracks and follow with heavy revolving brushes, but the heat in this instance merely loosens the frozen mass, which the brushes throw to one side to aid in obstructing the balance of the roadway.

With this state of affairs in existence, it was with much gratification that we recently examined a novel invention for removing snow and ice by the direct application of an intensely hot blast of flame generated by the familiar and simple apparatus of the blowpipe. The machine consists of a small steam boiler, upright and cylindrical in form, beside which another receptacle of like shape to contain naphtha is placed. The same fire serves to generate steam in one boiler and naphtha vapor in the other, and the whole is located on the front portion of a low wagon, the body of which is of iron and has a water bottom to protect the parts above from, as well as to confine, the intense heat beneath. Extending downward from the vapor chamber are one or two rows of tubes, the openings of which are in line across the bottom of the vehicle. A like number of pipes from the steam generator discharge steam jets just at the orifices of the vapor tubes; so that, the vapor being ignited, the steam mingles with the flame, becomes highly superheated, and also draws in a strong current of air to the same, through apertures in the large jacket tube which encloses each pair of pipes.

The mouth of each tube, therefore, when the machine is in operation, emits a steady stream of flame, hot enough, as we saw, to heat clay and stone beneath it to a bright red in a very few minutes, and certainly sufficiently powerful to demolish several inches of ice or snow by merely passing over. In fact the space beneath the apparatus, at the orifices of the tubes, looked like the interior of a furnace under a strong draft; and this heat, as the wagon advances, is carried under the same and confined by the body above and flexible runners, reaching to the ground on the sides, front, and rear. The mere force of the escaping blasts is sufficient to make cavities of some little depth in hard ground, when the machine is standing still, and to scatter ice and snow so thoroughly as to allow such as escapes complete melting to be easily swept away. It will be observed that the main objection to a steam blast, superheated or otherwise, namely condensation, is here absent, and that the heated gases are not merely applied to the surface of the mass, but driven directly into its very substance.

The inventor, Mr. C. G. Waterbury of this city, has made the subject an especial study for some years past; and judging from the favorable notice which his device is already receiving from city officials and others, there is a fair probability of its adoption, and some prospect of our streets being kept clear during next winter. It is proposed to put six machines at work on Broadway at the beginning of every snow storm, and let them melt the snow as it falls. A few men with brooms could quickly drive the water produced off toward the sewers, and thus that banking and caking of the snow which so effectually blocks the streets to traffic would be obviated.

PROGRESS OF RAPID TRANSIT IN NEW YORK.

The movement to secure the completion of a rapid transit railway through this city is beginning to take practical shape, and it will not probably be long ere the matter is brought to a successful conclusion. It is conceded on all sides that the principal obstacle in the way is the depressed financial condition of the country. Those who own first class real estate, in our midst, have for a long time been unable to sell or realize money thereon, except in ruinously small amounts.