employes carrying bundles and sacks of letters come to the table on the side opposite the machines and throw down the letters, without any order, in great quantities. The carriers here have to sort over the letters and pick out and separate from them the letters for New York city delivery. Those for outgoing domestic delivery are left upon the table. The New York city letters are taken elsewhere for cancelation.

The long row of operatives, one for each machine, attack the piles of letters, pull the letters over toward them one by one, face them, and note whether the stamp is in the right place and then feed them one by one into the machine. If the stamp is not in the right place or side, the letter would have to be reversed on its entrance into the machine. This work is done with great rapidity, the piles of letters disappearing as if by magic. Ordinarily during the day time a man works the machine only from five to twenty minutes at a time, but during the "rush hours" as they are termed, from 4:30 to 8 in the afternoon and evening, the work at the machines is incessant, and for three hours they are never idle. The capacity of each machine is 5,000 per hour, this capacity being limited purely and entirely by the capacity for feeding, as, if a man were able to work fast enough, between three and four hundred a minute could be disposed of. With the old hand service 3,000 per hour was a good rate of work for a man.

The construction of the machine is simplicity itself, and our two views, Figs. 2 and 3, illustrate it. Fig. 2 shows the horizontal projection of the machine as one looks down upon it. A belt is seen traveling around two rollers in the direction of the arrow. The lower portion of this belt is provided with a series of little blocks of leather so as to form a sort of shelf. The letters are fed in one by one at the narrow opening seen to the right of the lead of the belt nearest the reader. Their lower edges rest upon the blocks of leather as on a moving shelf, and the belt rapidly carries them along. As they move forward they are pressed by the belt pulley against a roller, the left hand one, on whose face is carried the canceling device for killing the stamps, and the dating die. In contact with this roller an inking roller operates, which is also shown. The left hand belt pulley is held to its place by a spring bearing, so that it can yield backward for letters of varying thickness, and constantly presses them against the canceling roller. Reference to Fig. 3, which represents the vertical aspect of the machine, in connection with what we have said, will render all clear. There we see the letter resting on the little shelf with the slide back of it. To the left, almost in line with the left hand belt roller, is seen a canceling roller with its waving lines and dating stamp.

It is evident that as the letter travels toward the left this will press against it, cancel the stamp and date the letter also. The letter now moves forward to a table, and through the table a sort of Archimedes' screw projects, which will be seen to be of conical contour. The screw catches the letter with its smallest thread and screws it forward, getting a better and better hold as the letter progresses, and finally pushes it forward out of engagement. Letter after letter is thus treated, placed, carried through, canceled, caught by the screw and carried along, the new letters constantly pressing forward those which have accumulated. The entire row of machines is driven by an electric motor, which runs at a speed of about 520 revolutions a minute and drives the canceling machine at a rate of 350 revolutions per minute; each revolution is capable of canceling a letter were it possible to pass the letter so rapidly through the machine.

The familliar device of the waving American flag is employed in this machine, the waving lines of the flag being employed to prevent the wearing out of the inking roller, as straight lines would inevitably depress it into grooves.

The dating stamp, without taking the machine apart, can be removed, have its type changed and then be replaced, the whole affair being the work of a few seconds only. There are now at work in the New York post office some twenty of these machines.

There is another kind of canceling machine used in the same office, the Barry machine, built by the Barry Postal Supply Company, of Oswego, N. Y., of which there are six at work. If it has the letters fed to it in bulk and faced, it can dispose of 30,000 to 40,000 letters per hour. For regular sized mail, such as circulars, which are often delivered to the New York post office in great quantities already faced and with the stamps in the same position on all the envelopes, this machine is highly advantageous. The two kinds in one office form a combination of high efficiency.

Our thanks are due to Mr. Thomas J. Clarke, Superintendent of Mails, New York post office, for courtesies extended in connection with this article.

IT is said that one-tenth of the population of England suffer from gout. Dr. Fehlauer, a Berlin physician, attributes this to the excessive consumption of meat, and recommends a more restricted or vegetarian diet.

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(Illustrated articles are marked with an asterisk.)

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PROPOSED PATENT LEGISLATION.

A very important bill, important in its list of authors as well as in its import, has been brought before Congress. It is the House of Representatives bill No. 3014, and provides for amendment of the existing patent statutes. In at least one of its provisions it makes a more radical change than has been seriously proposed for many years. The genesis of the bill is found in the meeting of the American Bar Association at Detroit, last autumn, where a committee of lawyers, including some of the most eminent counsel in patent cases, reported five general amendments. The abstract of their report, or text of the amendments which they proposed, may be found in the SCIENTIFIC AMERICAN of November 2, 1895, and the principal object of the bill we are considering is to put these amendments into force. It was introduced by Gen. William F. Draper, of Massachusetts. We will note seriatim the changes proposed.

Sections 4886 and 4920 of the patent statutes are amended so as to make one point a little more specific—namely, that knowledge or use by others in this country of the matter of his invention, before the date of invention thereof by the applicant, shall be a bar to the issuing to him of a patent. The same sections of the present law hold that patenting or publication in printed form abroad prior to the date of invention shall be a bar to patentability of the thing so patented or published. This is amended by introducing the additional restriction that patenting or publication abroad two years before the date of application, without reference to the date of invention, shall be a bar also. This is a restriction upon the inventor, and acts to inspire greater diligence.

Section 4894 is amended so that applicants for patents must prosecute their cases within six months of their date of application, thus doing away with the old two year period which has so often been abused rather than used by those who wished to obtain the quasi protection of a "patent applied for" before they were prepared to take out their final papers. By this amendment only six months are allowed to intervene between any action of the examiner and corresponding prosecution of the case by the applicant. It is also an amendment in the direction of inspiring diligence on the part of the inventor.

Section 4898 is amended to provide for proper acknowledgment of an assignment, grant, or conveyance of patent rights, so as to make them constitute a prima facie evidence of the execution of the instrument. This amendment is rather of the technical order and is valuable.

Section 4921 is amended to fix the limit of time to be covered by an accounting in infringement suits to six years, and harmonizes the practice in the different States. This is in sequence of the decision by the United States Supreme Court in the case of Campbell vs. City of Hartford, rendered January 7, 1895, and commented on in our issue of January 26, 1895. In that decision it was held that State statutes of limitation apply to accountings in patent suits. The amendment is designed to unify the law all over the United States, and seems a very desirable one.

The most important amendment in the whole bill is found in section 4887, which is very far reaching in its consequences. We give herewith the amended section in full:

"Section 4887. No person otherwise entitled thereto shall be debarred from receiving a patent for his invention or discovery, nor shall any patent be declared invalid, by reason of its having been first patented or caused to be patented by the inventor or his legal representatives or assigns in a foreign country, unless the application for said foreign patent was filed more than seven months prior to the filing of the application in this country, in which case, no patent shall be granted in this country. This section, as hereby amended, shall not apply to any patent in this country granted prior to the passage of this act, nor to any applications for a patent in this country then pending, nor to any patent granted on such a pending application."

The object of this amendment is to do away with the present practice, which makes the United States patent expire at the same time as a foreign patent for the same invention, bearing an earlier date. This feature of our practice is very objectionable, and followed the decision in the case of Bate Refrigerating Company vs. Sulzberger et al., Edison Electric Light Co. vs. U. S. Electric Light Co., and other recent decisions, which declared the United States patents involved to have expired prematurely, owing to the expiration of a foreign patent of prior date. These decisions have sometimes cut off several years from the natural term of the United States patent.

The United States patent is dated from the day of *issue*, while the foreign patents are generally dated from the date of *filing*, and the American inventor according to the present practice is compelled to postpone the filing of his foreign patents until his United States patent is allowed and ready to issue. The proposed amendment is intended to enable him to file his foreign patents without awaiting the result of the pro-

secution here, if he so desires. Under the present practice, his case may be pending in the Patent Office for several years, and the alternative is left to him either of running the chance of being anticipated in the meantime by some application in a foreign country or of having the term of his United States patent curtailed, owing to the earlier date borne by his foreign patents.

It is felt by those who have at heart the interests of the American inventor, and the patent system of the country, that the United States patent should stand as far as possible independent of the date or fate of any foreign patent for the same thing. The amendment proposed will no doubt afford this relief. There is unfortunately one feature of this section which cannot be accepted with the same feeling of approval. A foreign inventor is compelled, in order to fully protect his interests, to file his application in the United States within seven months of the date of filing his foreign patent. The term of seven months has evidently been suggested to the framers of this bill by the like term fixed by the International Convention.

It is a notorious fact, however, known to all attorneys having an extensive foreign patent practice, that the seven months term is entirely inadequate as far as the American inventor is concerned, and that he is able rarely to avail himself of its privileges. Fortunately for him, however, it is left optional with him either to file under the Convention or not, for he can still file his foreign applications, provided his United States patent was not yet issued. It seems unfortunate therefore that a term as short as seven months from the date of filing the application should have been selected.

The issuing of the patent abroad, in most cases, cannot be controlled as it can here, and the inventor has in many countries no intimation when the patent will issue. In Great Britain another problem presents itself, for the applicant may at his option file a provisional application. He is allowed nine months in which to file his complete papers, but the term of seven months has begun to run from the date of filing his provisional papers, and he has perhaps not yet completed his case.

It would seem, therefore, in view of these facts, that the section should read, "unless the application for said foreign patent was *issued* (*or sealed*) more than seven months prior to the filing of the application in this country." We think that such an amendment to the act would be in keeping with the broad spirit which has always animated our patent laws and practice, a policy which every one interested in the industrial and commercial development of this country wishes to see preserved.

Americans Win Olympian Laurels.

The 776th Olympiad began on April 6, and, for the first time since they were abolished, fifteen centuries ago, the famous games were revived—games, however, in which our modern cosmopolitan spirit is apparent by the lists being thrown open to the athletes of the world. The games were not held at the old Olympia, a small plain in Elis, but in the Stadium of Athens, an engraving of the interesting restoration of which was given in the SCIENTIFIC AMERICAN for January 11, 1896. The spectators flocked early to the Stadium, and soon 40 000 spectators, ncluding the King of Greece, the Duke of Sparta, and the Crown Prince, had assembled in the vast inclosure, while the surrounding hills were filled with spectators.

According to Dr. Marquand, Phayllus is said to have thrown the discus 95 feet. In the games at Athens, two Americans entered the arena to throw the discus —Captain Robert Garrett, of Princeton University, and Ellery H. Clark, of Harvard. Garrett threw the discus 29 15 meters (95·6 feet), defeating the Greek champion, Paraskevopoulos, by 19 centimeters (7½ inches). When it is considered that the Americans had little practice after their long voyage, and that Garrett was a novice at discus throwing—a game which has no modern counterpart, save, perhaps, the well known game of quoits—the wonderful versatility of the American athlete is apparent, and it is little wonder that, when the news of his victory was cabled to the United States, the halls of old Nassau rang with cheers.

The first heat of the 100 meter race was also won by a Princeton man, F. W. Lane, in 12⅕ seconds. The second heat was won by T. P. Curtis, of the Boston Athletic Association, in the same time. The third heat was run by T. E. Burke, of the Boston Athletic Association, in 11⅘ seconds. In the hop, step and jump, Connolly, of the Suffolk Athletic Club, Boston, covered 13 7/10 meters (44·9 feet). In the first heat of the 400 meter race H. B. Jamison, of Princeton, was first. The second heat was won by Burne, an Englishman.

On the second day of the games it is estimated that there were 100,000 spectators; the weather was perfect and the athletes were more accustomed to their surroundings. The first heat of the 110 meter hurdle race was won by Goulding, an Englishman. His time was 18⅘ seconds. The long jump was won by Ellery H. Clark, of the Boston Athletic Association, who covered 6·35 meters (20·8 feet). Robert Garrett, captain of the Princeton team, was second, with 6 meters (19·6 feet) to his credit. The 400 meter race on the flat was won by Thomas E. Burke, of the Boston Athletic Association. His time was 54⅕ seconds. H. B. Jamison, of Princeton University, was second. The next event on the programme was putting the weight. Capt. Garrett won, scoring 11·22 meters (36·8 feet).

In the evening the Acropolis and city were illuminated with myriads of lights. On April 8 occurred the shooting contest. The bicycle race at a distance of one hundred kilometers (62 miles) was won by Flamant, the French rider. The winner's time was 3 hours and 8 minutes.

On April 9 the weather was extremely cold, and the events consisted of shooting contests, saber contests and the 800 meter race. In the long distance foot race over the historic course from Marathon to Athens (26·1 miles), on April 10 the first three to cross the finish line were Greeks. The time of the winner was 2:48:00.

The 100 meter race was won by Thomas E. Burke, of Boston, in 0:12.

The high jump was won by Ellery H. Clark, of Harvard, who covered 181 centimeters (5·9 feet).

The hurdle race of 110 meters was won by Thomas P. Curtis, in 0:17⅘.

The pole jump was won by W. W. Hoyt, of Harvard, who scored 3·30 meters (10·8 feet). The Payne brothers, Americans, won the rifle and revolver contests. In the high jump, James B. Connolly and Robert Garrett each scored 1·65 meters (5·4 feet).

Cheap Gas for Heat and Power Purposes.

There is as keen a competition among the various industries which aim to supply a common want as there is among the men who create and carry them on; and it is as healthy and stimulating in its effect upon the industry as it is upon the individual. The possibility of supplying cheap gas to the people is one of the live questions of the day; and it has largely sprung out of the competition between the great gas and electrical industries. Additional prominence has been given it of late by the rapidly increasing use of the gas engine, and by improvements in its design which have brought it to the very front rank as a handy and economical source of power. The first introduction of the electric light created quite a panic among the gas companies. Most of us can remember the feverish activity with which they set about the improvement of gas apparatus, and how all at once the sickly glimmer of the common street lamp gave place to a flood of illumination, softer than the arc light, and in many cases of equal volume. Gas manufacturers were shaken out of their apathy, and not only improved the light, but began to figure on reducing its price. Unfortunately, the awakening was temporary —at least in the United States. When it was found that the cost of electric lighting would be much greater than its promoters had originally claimed, so much greater, indeed, that for domestic purposes it was incapable of successful competition, the gas companies settled down into the old rut, and were content to continue selling their gas at very large profits to a limited number of consumers. We use the terms "large" and "limited" in a relative sense, using as a standard of comparison the price and the consumption of gas in some European cities. The statistics of the principal gas undertakings of Great Britain for the year 1893 show that the consumption of gas per capita in that country, as compared with the United States, was surprisingly large, and the price remarkably low. Manchester, for instance, with the same population as Boston, sold her gas in 1893 for 60 cents per 1,000 feet.

As the result of this low price she sold 3,636,000,000 feet of gas, or more than the total amount furnished by the whole State of Massachusetts!

The cause of this wide difference is found in the fact that in Massachusetts gas costs on an average $1.50 per thousand, as against 60 cents in Manchester. These figures, startling as they are, are perfectly consistent with the economic law that, other things being equal, the consumption of a commodity in two different localities will vary in the inverse ratio of its price.

The above quoted figures are taken from the recent testimony of Mr. Henry M. Whitney, before the Legislative Committee on Manufactures, in regard to a proposal to furnish the city of Boston with cheap gas and coke. Whatever may be the merits or demerits of Mr. Whitney's proposal, the testimony itself is of such a high technical and scientific character, and the review of the present state of the gas and coke industry in this and other countries is so replete with up-to-date description of processes, and statistics of price and consumption, that it is worthy of a wider hearing than is possible within the hall of a legislative assembly. We have prepared a digest of the address, which will be found in the current number of the SUPPLEMENT.

The question of cheap gas, not merely for lighting, but for heat and power purposes, is of vital importance to the laboring classes of this country; for a family which cannot afford to use gas at say $1.69 a thousand, which is the price in East Boston, would gladly avail itself of gas at 69 cents per thousand, which is 9 cents more than the price in Manchester and 29 cents more than the people pay in Newcastle-on-Tyne, where they get it for 40 cents a thousand.

For domestic cooking there is no apparatus so clean and economical as the gas range, and for economy it is vastly superior to the coal fire, which, from the time it is lit for cooking to the time it dies out, consumes many times the amount of heat that is actually necessary to cook the meal.

Mr. Edward Atkinson, one of our most famous statisticians, has found as the result of careful experiment with a cooking range using coal that it took two pounds of coal to cook one pound of food, and he says: "I did not dare to rely on these empirical observations until they were more than sustained by Prof. Ferguson, of Lehigh University." Mr. Atkinson estimates that the average cost of the fuel used for cooking purposes, pure and simple, in a family is about $12.50 a year. Experiment showed that the same amount of cooking could be done by 3,600 feet of gas, which, at say 50 cents a thousand, would come to less than $2 a year; a saving to the family of more than $10 50 a year. This in itself would be no small saving to the laboring man; but of even greater importance would be the saving in time and labor and the greater cleanliness resulting from the absence of dust and ashes. That the people do not use gas because the price is prohibitive is shown by the statistics of Lowell, Mass., and Quincy, Mass. In Lowell, where gas is sold at $1.06 per thousand, there is one meter to every two families; but in Quincy, where the price is $2.12 per thousand, there is only one meter to every ten families. From these figures we are warranted in concluding that a reduction in the price of gas would be at once an enormous boon to the working classes, and, as a result of the greatly increased consumption, a positive gain to the manufacturers.

Of scarcely less importance is the question of the increased consumption of gas resulting from its extended use in gas engines. For some reason or other the gas engine has not received the attention in the United States that it has in England. No doubt the price of gas here has been prohibitory; and the greater attention that has been paid in this country to the development of the electric motor has caused the gas engine to be neglected.

It is stated that there are many European manufacturers who will furnish gas engines, guaranteed to run on 17 cubic feet of gas per horse power per hour; and Mr. Westinghouse, in this country, is building engines which he will guarantee to use 20 cubic feet per horse power hour. If gas could be supplied at the Manchester price (60 cents a thousand), such an engine would cost twelve cents per horse power per day for a day of ten hours. If the figures of Mr. Westinghouse's guarantee can be realized in practice, and if there are no local conditions which make it impossible to manufacture gas in the United States at something less than $1 per thousand feet, there should be a great future for the gas engine in this country.

Properties Lost on Railways.

In the English Strand Magazine Mr. W. Fitzgerald tells of the Lost Property office in London. He visited Scotland Yard, and the lost property rooms of most of the railway companies. He began with Euston, where about 30,000 articles are received every year. About three-fourths of the larger ones are restored to their owners, but there are more than twenty inquiries every day about articles which have been lost and not found. Four thousand unclaimed umbrellas are sold every year. A first class passenger from Liverpool to Euston had thrown his artificial teeth out of the window with some plum stones. The line was searched, and the teeth were found, and duly restored to their owner. At King's Cross it takes six weeks to sort up the articles for the annual sale. The Great Northern sells two tons of newspapers every twelve months. Umbrellas are sold in lots from six to thirty-six, and fetch from $10 a lot downward. All the lost property found in the Great Northern last year unclaimed was sold for $850. As 1,000 walking sticks and 1,300 umbrellas were included, the articles must have been sold dirt cheap.

The Great Eastern railway company last year sold the following articles among the unclaimed lost property: "One hundred and forty handbags turned up, and there were five huge cases of books; 459 pairs of boots and shoes; 614 collars, cuffs and fronts; 252 caps; 505 deerstalker hats; 2,000 single gloves; 230 ladies' hats and bonnets; 94 brushes and combs; 265 pipes; 110 purses; 100 tobacco pouches; 1,006 walking sticks; 300 socks and stockings; 108 towels; 172 handkerchiefs; 2,301 umbrellas and 7 big cases and 128 separate articles of wearing apparel."

There are any number of gloves which are sold very cheap. At the last sale 2,000 gloves went for about 2 cents a pair. At the London and Southwestern line last year the lost property included 103 mackintoshes and 340 hats and caps. The purses found in the trains at the Southwestern yield on an average $500 a year.