Correspondence.

The Design Patent Law.

To the Editor of the Scientific American:

The editorial in the SCIENTIFIC AMERICAN of November 11, upon a recent decision of the Commissioner of Patents in relation to design patents, seems to have been written under a decided misapprehension of the existing practice in the Patent Office.

It is stated in that article that heretofore the grant of design patents has been limited to "designs for decorative work" only, and that the custom of the office has been to refuse patents for new and better shapes of machines and articles of manufacture. If by "better" is meant that the shape of the given thing renders it more capable of performing its function, then the practice has been correctly stated, and the decision referred to simply confirms this practice, and is based upon sound principles; if, however, the word be not so used, the incorrectness of the view taken is unequivocally shown by the office portfolios, which are filled with drawings of patented designs in all classes of invention. Design patents for the shape of chairs, tables, sofas, steam engines, and their frames, and even for the configuration of complicated machines, have been granted in large numbers. Patents have been refused mainly in those cases in which the shape sought to be protected has performed some mechanical function, and should therefore have been made the subject of an application for a mechanical patent. The T-shaped shingle machine referred to was refused protection for this reason, not because the design was not ornamental. Had the specification merely described and claimed the shape of the machine, without reference to the mechanical advantages arising from such shape, a patent would have been granted without question, as clearly appears from the record.

The decision of the Commissioner in the Norton case does not change the practice of the office in any particular. The case turned upon the question of the meaning of the word "useful," employed in the Design Act to define one of the qualities of patentable shapes or configurations of articles of manufacture. Is its meaning that of the ordinary language of life, or has it that technical sense which it has judicially been declared to have in the statute relating to mechanical inventions?

"'Useful' in the patent law," says the commissioner, "is in contradistinction to 'mischievous.' The invention should be of some benefit (Cox *vs.* Briggs, 2 Fish. 174). A design if not 'mischievous,' is useful if it attracts persons to it, or to articles made like it. It may not be of great artistic excellence, but if it be attractive it is useful."

In the light of the record, the important point determined by the decision in question is that the mechanical function performed by the shape or configuration is not to be considered in determining its patentability as a design. A shape alleged to produce a mechanical effect is to be protected by a mechanical patent. Patents are to be granted only for designs which are intended to appeal either to the eye or the æsthetic sense. It is not necessary that the article should be ornamental. The requirements of the statute are complied with if its appearance is such that purchasers are attracted to it. The law does not inquire into artistic excellence, but does require that the design should in some measure be attractive.

This decision of the commissioner is in strict accord with that of the Supreme Court of the United States in Gorham Manufacturing Company *vs.* White, 2 O. G. 592, in which it was said that the Design Act was "intended to give encouragement to the decorative arts," and that "it is the appearance itself . . . which constitutes . . . the contribution to the public which the law deems worthy of recompense."

Washington, D. C., November 15, 1882.

The Utilization of Natural Gas.

The steady decline in the yield of petroleum in the Pennsylvania oil regions is causing capitalists to turn their attention to the greater utilization of the natural gas which is a peculiar feature of the region. The drilling of oil wells is always attended by the appearance of inflammable gas in larger or smaller quantities, but its presence is not a necessary attendant of the finding of oil. Many years ago natural gas was discovered in Fredonia, Chautauqua County, N. Y., and it has been in constant use, both for fuel and light, at East Liverpool, Ohio, for twenty years, and no petroleum is found in either place. The presence of this gas in the oil regions has been one of the main causes of the development of the territory to so great an extent that the exhaustion of the petroleum deposit has been accomplished years before it otherwise would have been, for its adaptability and economy as fuel has permitted operations to be carried on where otherwise they must have been attended with loss to the producers. It takes from twenty three to twenty-five days to drill a well, and companies controlling the supply of gas furnish fuel for the boilers at an average cost of $1.25 per day per well. To buy coal or wood for this purpose would cost several times as much.

Bradford and nearly all of the oil region towns are lighted and heated by the natural gas. The "gas streaks," as those districts are called where the gas is found without oil, are very extensive in this field, and they were secured by companies years ago. These companies—the Keystone Gas Company and the Bradford Gas-light and Heating Company—furnish nearly all of the gas supply. They are chartered by the State. The latter company supplies this city with light and heat. Its principal "streaks" are the Rixford and the West Branch. The former is seven miles southeast of this city, and the latter lies two miles to the southwest. Six wells take the supply from these streaks, three on each. The Rixford gas is collected in immense iron reservoirs at the wells, whence it is forced to Bradford through iron pipes. For four miles of the distance the pipes are six inches in diameter, and for the other two miles eight inches. From the West Branch wells the gas reaches the city through 8-inch pipes by its natural force. The pressure of this gas at Bradford is six pounds and a half to the inch. Ingenious pumps of recent invention force the gas from the Rixford receivers, where it has a pressure of 40 pounds to the inch. Less than a year ago the Rixford gas reached this city by its natural force at the wells—a force sufficient to supply Bradford with 1,000,000 cubic feet. To drive the gas that distance now requires the use of a 400-horse-power engine, and the natural force of 170 pounds to the inch has declined to 25. The machinery for pumping the gas cost $50,000.

The natural gas is found in the largest quantity and greatest force in the third oil sand, and seldom deeper than fifteen feet in the sand. It is present, however, in all three of the sands in some wells. The wells are drilled just as oil wells are, and gas territory ranges from $150 to $500 an acre. It is destined to be worth much more when the finding of gas may be calculated on with certainty. In the Bradford field, gas has been found at no greater depth than 2,200 feet. It is used just as it issues from the depths of the wells, no refining being necessary. The gas of some districts is better and cleaner than that of others, the Bradford article being especially excellent in quality. There is no odor from it in burning, but before it is consumed it has the same as petroleum. In carrying it through the towns and into buildings the same system is employed as in conducting artificial gas, and for illuminating purposes is burned in the ordinary gas-fixtures. In many parts of the oil regions the pipes are laid on the surface of the ground, but in the larger towns and cities they are buried. For heating purposes a pipe is conducted from the main into the stove or range. The end of the pipe in the stove is perforated to give a spreading flame. A stop cock on the outside of the stove regulates the supply. The fire is kindled simply by turning on the gas and throwing a lighted match in the stove. In grates the effect of a coal fire is obtained by the placing of pieces of earthenware inside. These become redhot, and glow with the true anthracite cheerfulness.

For illuminating purposes a uniform charge of fifty cents a month is made to the consumer. Where twelve burners are in use, a discount of 20 per cent is made. To large consumers, such as hotels, stores, etc., a further discount from the twelve burner rate is given. An ordinary family parlor or cook stove pays $4 a month for fuel, while range and large heater cost $6 a month. In the early days of gas burning in the region an ordinary stove consumed about 300 cubic feet an hour. The subject has been given much scientific study, however, and a regulator devised by which the amount consumed is much reduced without affecting the heating power of the fuel. The gas is not measured. It is a matter of much surprise to the stranger visiting this region to see the gas in buildings and on the streets burning all day as well as during the night. No one takes the trouble to turn off their gas. It is believed that the gas would be consumed and wasted in other ways, even if it was turned off, and so it burns from one year's end to the other. For heat and lighting, the gas companies require pay in advance per month, but well drillers pay at the end of the month. At one time the Keystone Company had 500 drilling wells attached to their pipes, but not one quarter of that number are drilling now. The traveler through the oil regions will see great pillars of flame high in the mountains, in the depths of forests, and down in the deep valleys. These are made by the waste gas coming from pipes inserted in the wells. They burn constantly. Many of the smaller oil towns are as light by night at they are by day, owing to the presence of these pipes in their streets.

Natural gas at drilling wells causes many fatal accidents. Veins of it are sometimes suddenly penetrated by the drill, and it issues with great force to the surface. In such case it is liable to become ignited by the lamp in the derrick or the forge or by the fire-box of the boiler. It is more by good luck than anything else then if occupants of the derrick-house escape with their lives, for a frightful explosion occurs. Even if the lamp or boiler is removed far from the derrick, an explosion is apt to occur, especially if the atmosphere is murky and heavy. Then the gas settles to the ground, and if blown toward the light or fire an explosion is inevitable. Gas is found in large quantities in the Sheffield district of the Warren oil field. One of the heaviest wells ever struck is at Sheffield. It has been burning with a flame 50 feet high for years, and its roar may be heard for miles. Another heavy well is the Murrayville well, in Washington County. There is a great gas streak in that region, and a company has been formed and chartered by the State to supply Pittsburg and other places with light and fuel from it.—*Bradford, Pa., Correspondent of the N. Y. Times.*

COST OF THE EAST RIVER BRIDGE.—At the November meeting of the trustees of the East River Bridge, it was reported that the total cost of the bridge up to the present time is $14,045,683.86.

Education for Civil Engineers.

If a census could be taken of all the young men of the age of thirty who are in charge of parties on railroad location or construction, it would be found that those who graduated from technical schools were receiving the highest salaries and had the best prospects for promotion, and further, we feel confident that in number they would far outrank the others. This cannot be said of men of fifty, for thirty years ago, when they were young, technical schools were scarcely known. To argue that, because these older engineers have attained reputation and success without the advantages of scientific education, the young men of to-day can do so likewise is certainly fallacious, for the conditions in the two cases are far different.

An inspection of the lists of graduates given in some of the catalogues of technical institutes shows that young men who have been six years out of the school, in general, hold responsible and lucrative positions. On graduating, they began at the bottom of the ladder with low pay, but they have rapidly mounted the steps, passing and often leaving far behind those who began the ascent when five years younger. In fact, we know of no profession where the graduate advances so rapidly as in civil engineering. A young doctor finds it hard to obtain patients, even when he furnishes both services and medicine gratis. A young lawyer is glad to take cases where he receives nothing if he loses, and almost nothing if he wins. But the young civil engineer earns at once as rodman or draughtsman fifty dollars a month, and usually double or triple that amount after a very few years of practice.

The indications are, that technical education, as a qualification for technical pursuits, will grow every year more and more important, until finally it will become, as it is now in Germany, indispensable. Already some railroads hire for their field parties and draughting offices almost no others than technical graduates. They do this because they find it pays. A young man who is trained how to think is of more value to them at higher wages than one who does his work by rule of thumb at lower wages. He does more work in a day and does it better.

And when we look at the question from other points of view than the financial, everybody will agree that the young man of education has the advantage. The locating engineer, for example, does his work with a more cheerful mind, if he knows something about the rocks of the country through which he travels. He has an interest in the progress of science in general, as well as in that of his own specialty. When the panic comes that stops his work and his pay, he is not so bound to his trade that he cannot try his hand at something else. In such times, too, he feels at liberty to ask the alumni of his institution to assist in securing him employment. This may, perhaps, seem a trivial matter, but as a rule men's lives are largely controlled by circumstances, while those who are able to control circumstances are few; and many a college man will testify to encouragement received from his brother alumni in times of commercial depression, encouragement without which his life might have been very different. There is one other point suggested by the remarks made, two weeks ago, by Herbert Spencer, concerning overwork and gray hairs, that should receive the careful attention of parents who are puzzled to know whether to give their boys a technical education or put them at once into practical work. Much of course depends on the boys, but if they have any liking for study, we say by all means let them continue at it. In these days of hurrying business rush and overwork, let us keep the young men out of the world as long as possible. Let the days of their youth be spent in academic halls, where the worry of business is unknown. Let the selection of their special branches of engineering labor be deferred until they are qualified by age and experience to select. Overwork and gray hairs come soon enough to men, even when life is begun at twenty-two, and by commencing younger nothing whatever seems to be gained, but rather much seems to be lost.

To conclude: A young man who wishes to attain success and happiness in the occupation of a civil engineer ought to begin by obtaining a sound technical education.—*Engineering News.*

Indigenous Potatoes in Arizona.

At a meeting of the California Academy of Sciences, November 6, Mr. John G. Lemmon reported the results of a summer's tour of botanical exploration among the mountain ranges along the Mexican frontier of Arizona. Among his discoveries were two or three varieties of indigenous potatoes, found growing abundantly in high mountain meadows surrounded by peaks attaining a height of 10,000 feet above sea level. The tubers were about the size of walnuts. Mr. Lemmon brought home a supply which will be carefully cultivated.

This interesting discovery goes far to settle the long vexed question of the origin of the potato.

No Tin in Colorado.

We learn from Mr. James F. Downey, editor of the *Mining Register*, Lake City, Colorado, that the paragraph that is going the rounds of the papers, and which was copied into our journal of October 28, is without proper foundation. No tin has yet turned up in Colorado, writes Mr. Downey, but nearly all other earthly treasures are to be found there in abundance.