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(Illustrated articles are marked with an asterisk.)

A NEW PATENT LAW IN CANADA.

We have the pleasure of announcing that the Parliament of the Dominion has just passed a new patent law, which, among other judicious provisions, grants to American citizens the privilege of obtaining patents in Canada on very favorable terms.

We hail the passage of this law as an indication of real progress on the part of the people of Canada. Its practical operations can hardly fail to prove advantageous to the material interests of the Dominion.

A valued correspondent in Canada furnishes the following *resumé* of the provisions of the new law, which goes into effect on the first day of September next:

The law provides that all inventors, or their assigns, may receive patents, provided a foreign patent for the invention has not been in existence for more than one year prior to the application being made for the Canadian patent. Improvements on existing patents may also be patented.

The applicant shall, for the purposes of the act, elect his domicile in some known place in Canada—this being a mere formality.

The patent will be issued for five, ten, or fifteen years, at the option of the applicant; but, at the expiration of the first five or ten years, the patent may be extended for another term of five years; there is no provision for extension after the fifteenth year.

In case of error or defective description, the patent may be reissued, as is the case in the United States.

In case of an assignment of a patent, such assignment must be registered in the Patent Office.

The law provides for remedy in case of infringement of patents—and also for the impeachment of patents before the courts.

Every patent will be subject to the condition that the patentee shall manufacture the invention in Canada within one year from the date of the patent; and the patent is to be void if, after the expiration of one year from its date, the patentee or owner causes the importation in Canada of the invention for which the patent is granted.

The fees payable to the Patent Office for each patent are at the rate of $20 for each period of five years. When the patent is refused, half the fees may be returned to the applicant. This rule is always acted upon.

Inventors may file caveats, to be kept secret and of record for one year.

Patents may be refused when the alleged invention is not patentable in law, or when it is already in the possession of the public, or when there is no novelty or utility in the invention, or when it has been described in a book or printed publication, or when it has already been patented in Canada, or elsewhere by the inventor for more than one year previous to the application.

When a patent has been refused, appeal lies to the Governor in council within six months after notice of such refusal.

In case of interfering applications, the case may be referred to three arbitrators, one to be appointed by each applicant and the third by the Commissioner of Patents—their decision to be final. The fees of arbitrators to be a matter of agreement, except those of the arbitrator appointed by the Commissioner, which are to be paid equally by both parties.

Patented articles are to be stamped as such, and a fine of $200 is imposed for false marking.

By reference to a card in another column, it will be seen that Messrs. Munn & Co. are now ready to receive applications for patents in Canada.

PROGRESS OF THE EIGHT HOUR STRIKE.

The many acts of violence, to which the workmen supporting the eight hour movement in this city have taken recourse, seem to have culminated in the shooting of James Brownlee, a carpenter and non-society man, who was quietly at work in a shop on Forty-first street, near First avenue. It appears that two of the strikers threatened him with personal assault if he did not at once quit work and join them in the strike. Fearing that they would carry out their threats, Brownlee left the shop and passed into the street, when one of the men who had followed him drew a revolver and shot him through the cheek, saying at the same time "That's the way we treat such as you are." This atrocity, although promptly disavowed and condemned by many of the organizations, has produced a powerful effect on the community at large, and has resulted in a marked diminution of public sympathy for the cause. The threats of abandonment of work, on the part of the men employed at the gas works, have caused, during the past few days, considerable apprehension throughout the city lest the streets at night should be left in darkness, but the danger has been happily averted by the gas companies acceding to the terms demanded.

The small number participating in the procession, which was intended to exemplify the great strength of the movement, has been a source of disappointment to its advocates. The working men for some reason viewed the idea with disfavor, so that, instead of an army of thirty thousand men, barely twenty-five hundred paraded through the streets. There was no disturbance along the route, nor any cheering, but simply a lack of enthusiasm which fell like a pall on the sanguine expectations of the strikers. During the remainder of the past week, the desertion and returning to work of a large number of employees of Singer's sewing machine factory has rendered the movement still weaker; and although a considerable number of men still hold out, it is the general belief that it must eventually fail.

Advices from out of the city inform us that the strike is but little felt, and that its effect has been rather beneficial to manufacturers in other States. The reason is that the better class of workmen who have no sympathy with the movement find themselves compelled by the action of their trades' unions to leave the city and obtain labor elsewhere, while the malcontents throughout the country flock to New York in hopes of getting increased wages.

On the part of the manufacturers, the position adopted in the beginning has been steadfastly maintained. The pianoforte makers publish a series of resolutions which clearly and forcibly define the stand they have taken. They state that, in case they are forced to raise the price of the goods thirty-three per cent, they cannot compete with the makers in other parts of the country, in whose productions there has been no corresponding advance. Nor, since the trade in the smaller sizes of pianos is mainly local, can they afford to raise the price of their instruments, as the cost of an ordinary piano would then be so great as to be without the reach of a large majority. As far as this branch of manufacture is concerned, it is claimed to be evident that concession to the terms demanded by the working men is absolutely impossible; and we have been assured by the leading firms in the city that if they did yield to the exactions of the strike, the result then would be no worse than if they abandoned their business and sought investment for their capital elsewhere.

The carriage makers, although forming no combinations among themselves, agree in substance with the views of the pianoforte men. The proceedings of the workmen from the establishment of Brewster & Co., of Broome street, are the most incomprehensible of the many vagaries to which the strike has given rise. This manufactory has been carried on on a coöperative principle; that is, the employees owned an interest in the profits of the business. They were fully represented in the management of the internal economy of the concern, had a voice in the regulation of their own pay and hours of labor, and received dividends proportioned to the amount of wages paid them. Three days before the strike they declared themselves satisfied with the existing arrangement, and actually, as we are informed, refused to vote themselves eight hours as a day's work. In spite of all this, suddenly, at the instigation of a few malcontents among their number and intimidated by the trades' unions, they joined the strikers, and, in addition to leaving their work, deliberately forfeited a dividend of several thousand dollars, which was shortly to fall due them.

As to the final result of the movement, we consider that there is but little doubt. Want of support from other cities, the firm front presented by employers, together with the convictions, which are evidently being brought home to the minds of the more intelligent workmen, of the impracticability of the scheme, will end in its abandonment.

It is our belief that coöperation is the most efficient means by which the laboring classes can hope to secure the privileges which they now claim as rights.

WEIGHT, PRESSURE, FORCE, POWER, WORK.

The fact that the above words are often confounded together, for the simple reason that their true meaning is not well understood, has been the cause of many fruitless attempts at mechanical inventions and improvements. Most searchers for perpetual motion make no distinction between pressure and force, and are under the delusion that mere pressure can produce work, and we have seen writers on mechanics and we have even heard lecturers on scientific subjects speak of a force of, say, two tuns weight. Weight alone is not force, neither is pressure equivalent to work; and it may therefore be useful to attempt some clear definitions of the above terms, in order to protect inventive minds against mistakes in mechanical reasoning.

Weight is simply the measure of an amount of matter referred to a certain standard accepted as a unit. This unit may be a gramme, a pound, a tun, or our whole earth, which the astronomers use; but, in either case, it conveys to the mind nothing but the conception of an inert mass, or a certain amount of matter, for the determination of which gravitation gives us the means of measuring and comparing. Therefore we may say: To have "a mass of two tuns," but not "a force of two tuns."

Pressure is a result of this gravitation, and a mass of two tuns will exert a pressure of two tuns; in this way, we may estimate the effect of a spring, hydraulic press, or other similar contrivance, by saying its pressure (not its power) is equal to two tuns, meaning thereby that it has the effect, on the material to be pressed, as if two tuns weight were placed upon it; but we have in pressure neither force nor power. These conceptions of the latter require other elements, as we shall soon see.

Force is matter in motion, nothing more, nothing less; the abstract idea of force without matter is a nonentity. All the modern discoveries in science tend to prove this more and more plainly. Without matter, force would have no existence, but it may be hidden in matter as molecular invisible motion in the form of heat, electricity, etc. The steam engine, electromagnetic engine, etc., are there to prove how this molecular motion, or hidden force, may be changed into visible force or motion of matter. Inversely, the caloric friction machine changes motion into heat; the ordinary and also the Holtz electric machine change motion into electricity. In any case, we are driven to the conclusion that all force proceeds from motion of matter, and is finally resolved into motion of matter, either of masses, or into molecular motion, generating one of the so-called imponderable forces.

Chemistry has proved since the last century that the amount of matter in the Universe is a constant invariable quantity, and that we cannot create or destroy a single material atom, but can only change its form from solid to liquid or gaseous, or *vice versâ*. So the modern philosophy of mechanics proves that the amount of force (that is, motion of matter) in the Universe is a constant quantity, and that we cannot create or destroy the slightest amount of this force, but can only change it from mass motion to molecular motion, that is, heat, electricity, etc., or *vice versâ*.

The measure of force is thus the product of the mass with the distance through which it moves; and as the unit of measure of ordinary masses is the pound, and of distances, the foot, we have adopted the foot-pound as the standard unit of force, meaning "one pound *lifted against gravitation* one foot," not "one pound moved one foot," as we have seen and heard it stated, which of course gave rise to the most absurd calculations in regard to the immense power obtained to drive a steamship or railroad train.

If one pound weight is raised one foot, one unit of force is expended; if, inversely, we cause one pound to descend one foot, we obtain a unit of force back, and may transform this into other mass motion, or into molecular motion. We may cause this mass of one pound to be raised slowly if we have little power to apply, or rapidly if we have greater power; and, inversely, we may cause it to descend slowly, as is done in the weight of a clock, and spend itself gradually during a long period of time, producing slight effects throughout that time; or we may cause it to descend quickly, as is the case with the blow of a hammer, and spend itself during a very short period of time, almost instantaneous, producing a powerful effect for that short time. So the driving in of a nail, which often the pressure of a tun weight would not accomplish, the blow of a hammer of one pound, lasting a small fraction of a second, will accomplish easily. This remark points out forcibly the difference between the weight of masses at rest and of masses in motion, in other words, the immense difference between mere pressure and force.

RUBBER GRAPHITE PAINT.

A waterproof paint, for metal roofs, fences, bridges, ships, and every kind of wood structure, which, at the same time, could be relied upon to reduce the corrosive influences of exposure to the atmosphere, is an article for which the demand would appear to be almost without limit. A patent has just been issued, through the Scientific American Patent Agency, to Mr. Samuel F. Mathews, of Harrisburg, Pa., on an invention intended to meet the wants of the community in this respect; and from the ingredients he uses, we think his paint will answer a good purpose.

The rubber graphite paint is a solution of pure india rubber in linseed oil, which is ground with graphite into a thick, elastic, smoothly flowing paint. Compositions of which india rubber forms a part possess in the most eminent degree the quality of resisting the action of moisture and of corrosive gases carried in the air. In the graphite, we have a pure form of carbon; and it appears to be well known that paints containing carbon in any form last longer than other kinds not having it as an ingredient—holding their body and color when the other paints are totally destroyed. We do not see why this compound, combining as it does these two valuable elements, should not form a paint of great durability and highly protective qualities,

All shades of color from black to gray, or cream color and the drabs, can be made as desired. A company under the