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PROPOSED SALE OF THE YOSEMITE VALLEY.

The proposition to sell a portion of the Yosemite valley to certain persons, as pre-emptors of the land, is again before Congress, and has been reported upon favorably by the committee appointed to consider the subject. As this valley belongs to the people of the United States, the question appears to be between two squatters and all the rest of the inhabitants as to who shall finally obtain control of the grandest scenery on the face of the earth. It is a matter of so much importance that we think proper to devote some attention to it, for the sake of entering an earnest protest against any sale or cession of the territory to private speculators.

The valley of Yosemite was discovered in 1851, by a party of white men hunting for stock which the Indians had stolen. They recovered a portion of the stolen property, and returned with marvelous accounts of the extraordinary scenery of the new region which they had found about midway between the summit and the base of the Sierra Nevada mountains. Notwithstanding the enticing character of these accounts very few persons ventured into the valley, on account of the difficulty of access, and the distance from any base of supplies.

Mr. Hutchings, one of the present claimants was one of the first to explore the place, and, in 1859, J. C. Lamon moved into the valley and settled on the land now claimed by him. According to all accounts Mr. Lamon appears to be a bona fide settler, entitled to compensation in case of removal. He has resided on his claim for more than ten years, and has been engaged in setting out fruit trees and raising vegetables, but has never kept an hotel or house of entertainment.

On the 13th of June, 1864, Congress passed a law by which the United States gave to the State of California the Yosemite Valley and the land within one mile of the walls thereof, and the Mariposa Grove of Big Trees, to be held in trust forever as a pleasure resort for the people of the United States. The State of California accepted the trust in the spirit in which it was given, and at once appointed Commissioners to make surveys and lay out suitable roads for the accommodation of visitors. Two of the Commissioners are well known in the East—they are Professor J. D. Whitney, the eminent geologist, and Mr. Frederick Law Olmsted, of the Central and Prospect Parks. These gentlemen made elaborate reports to the Legislature as to the work to be done and the proper way to begin it. Galen Clark, who lives near the valley, was appointed its guardian by the Commissioners, and all expenses were paid by the State. In 1864, while the bill ceding the valley to California was pending, Mr. Hutchings bought out some parties who had built rude huts, and has since put up a frame hotel, with accommodations for thirty guests. His claim is situated about half way up the valley, and extending entirely across it. The Commissioners tried to compromise with these claimants by giving them leases of the premises for ten years at a merely nominal rent. The offer was rejected, and suits of ejectment were commenced, but they have never been pushed to final judgment, as the parties were anxious to procure legislative interference. The whole question finally came before the California Legislature, and that body, in the most unaccountable manner, passed an act giving each claimant one hundred and sixty acres of land in the valley, providing the Congress of the United States would give its assent—such assent being necessary to a clear title. The Governor of the State, to his credit be it said, vetoed the bill, but the Legislature, renowned in the history of the State for its venality, re-enacted it over his veto; and in this manner the claimants find their way to Washington, and a desperate

struggle will be made to confirm the spoliation so disreputably begun in the West.

The land was first surveyed in pursuance of the act ceding it to the State. No portion of it was ever declared open to pre-emption; all that the Government promises to squatters is, that, in case the land comes into market, actual settlers shall have the first claim to buy it. This land never was in the market, and it was never intended to sell any portion of it.

There is no doubt that Mr. Lamon, who went to the valley and tilled the soil as an actual settler, is entitled to compensation. All he at one time asked was \$12,000, and \$8,000 more would satisfy the claims of the other parties.

It would be infinitely better to pay the \$20,000 and eject these persons than to give them the best portions of the valley, and thus open it to the entrance of the worst class of speculators, gamblers, and disreputable characters. What would the inhabitants of Europe say if the valley of Chamouni were offered for sale, or if the Zermatt and Monte Rosa were in the market? Doubtless the same that must be said of us if we permit the Yosemite to pass into private hands.

The Yosemite valley is said to afford the finest scenery known to man. It is only accessible at the lower end by two trails that abruptly descend 2,000 feet. The walls for six miles are nearly vertical, and in some places are a mile in height, and are composed of pure white granite. But the crowning glory of the place is the Yosemite Fall, which in three leaps falls 2,634 feet. There is no water-fall in the world to compare with this. Other falls are, the Bridal Veil, 940 feet; Vernal, 350 feet; Nevada, 700 feet; and Royal Arch Fall, 1,300 feet. The valley is only a mile and a half wide at the broadest part, and in most places is less than half a mile. This adds to the apparent height of the perpendicular walls on either side. If private individuals were to obtain control of all these wonders, the inconvenience to the public, and the impositions to which all travelers would be subjected, would be insupportable.

The original law of Congress granting the valley to the people of the United States as a pleasure ground for their use forever, was one of the most enlightened acts of legislation on record, and it would be better to stand by the original bill. If the State of California is weary of the trust, then let Commissioners be appointed by Congress, to whom shall be confided the important responsibility; under no circumstances and on no pretense, ought the property to pass into private hands.

CO-OPERATION AMONG INVENTORS.

We have recently had suggested to us by sanguine correspondents, that a grand coöperative scheme among inventors to establish a central bureau or college of invention would be of great public benefit. This institution would, according to the plan proposed, receive its endowment from contributions of inventors to furnish a building and apparatus, and remunerate a paid court of experts to test and decide upon the merits of inventions.

This scheme might perhaps seem at first sight to have some merit. It has, however, the great drawback that it is wholly impracticable.

The inducement relied upon to obtain contributions, is a future personal benefit to the contributor. This would not be sufficient unless the donor were guaranteed, or supposed himself to be guaranteed the promised benefit. At best, the benefit would be contingent upon his making an invention of such doubtful value that he himself could not decide upon its merits; or that those engaged in the business or department of industry in which the improvement is proposed and to whom he can have access, are unable to decide. An invention, the value of which is so doubtful as this, can be safely said to have no value.

But supposing that every invention may possess more or less merit, and that each inventor could be guaranteed that upon sending a model or drawings and specifications to the "Inventors' Coöperative Central Bureau," an examination would be duly made, and a report with reasons for the decision arrived at duly forwarded to him; how few would accept such a decision as final, provided it was adverse?

In our own practice as Patent Solicitors, we often meet with men who, when we pronounce their devices neither new nor useful, are offended and straightway make application to some one less scrupulous, who encourages them to proceed, takes his fee, and does not get them a patent; or, if they get a patent, it is done by so cutting down claims as to render the patent not worth the paper upon which it is printed.

Commissioner Fisher, in his last report, says most truly, that inventors "are lacking in legal knowledge. They desire a cheap solicitor, and do not know how to choose a good one. They are pleased with the parchment and the seal, and are not themselves able to judge of the value or scope of the grant." Thus they fall into the hands of sharks, who, as Commissioner Fisher again says most forcibly, "are more desirous of obtaining a patent of any kind than one which will be of any value to their clients."

One of our correspondents has anticipated such an emergency, and suggests a higher court of experts, to whom appeals can be made, and whose judgment shall be final. But alas for the weakness of human judgment! Those not satisfied by the decision of an inferior court would not be any more satisfied with the opinion of the court of appeal, provided it should also decide adversely; and so discontent and murmuring would arise, and instead of the anticipated coöperation there would be breaking up into factions, each of which in its endeavor to get control of the institution would not hesitate to pull down a stone from its walls, until final ruin would wind up the entire concern. Moreover, this method of testing inventions would be, in the average, far more expensive than

for each inventor to test his own invention in connection with those qualified to pass upon its merits; and it would be attended with such delays and annoyances as would render it at once and permanently unpopular.

The only way in which money can be obtained for a benevolent object without compromising success is as a free gift, with no contingent personal advantage pledged to the donor; and in most cases it is better that even all control over funds thus donated should pass from the givers and become vested in responsible trustees. In this way colleges and universities are endowed, and the great difference between such gifts and those by which the funds for the Inventors' Bureau are proposed to be obtained, is that they are free gifts for the good of others, not gifts contingent on some personal good to be subsequently received.

But while we deem this scheme of coöperation as utterly impracticable, there is a way in which inventors and mechanics may coöperate with universal benefit. This scheme is set forth in an article on page 345, Vol. XIX., in which we advocated the establishment of a national collection of new inventions, to be placed on view so that all who wish may examine and inform himself upon any point by the payment of a small fee. Such an institution would be of present and permanent value, and it might easily be established by a properly organized association of inventors.

THE USE OF SALT IN AGRICULTURE.

Whether common salt is of any value to plants, is still a mooted question, and one that finds advocates on both sides. The luxuriant growth of marsh meadow grass is taken as a proof that salt water must be favorable, and farmers attempt to imitate this state of things by putting salt on the grass without reflecting that all other conditions are omitted in the experiment. They are generally astonished to find that the grass is killed, instead of being promoted in its growth. It is a remarkable fact, that this same salt marsh grass, on analysis, is found to contain very little soda, but to have its full complement of potash. This would seem to indicate that it had grown in spite of the salt, rather than in consequence of it. According to some recent researches, made in France, potash is a hundred times more valuable to plants than soda. It is true, that small quantities of soda have been found in plants, but, generally, under circumstances that seem to point to its accidental rather than essential presence. Direct experiments have shown that salt is injurious to tobacco and to the sugar beet. An examination of the plants growing near salt springs and salt marshes, shows that the vegetation is of a limited and peculiar character. All of these observations point to the conclusion, that the direct use of salt, as an artificial fertilizer, is only applicable to such plants as grow on the sea shore, or near salt springs, and not at all to the usual grass and cereals of our farms. The whole system of manuring farms is based upon the principle to restore to the soil the constituents that are removed by the crops. As the crops carry away no soda, it follows that none is necessary to their growth. There is another objection to the use of common salt, and that is the chlorine contained in it. This element is decidedly injurious, as has been shown by the experiments of Wolf and others. Public opinion in Germany has set so strongly against the use of salt, that, in the famous mines of Stassfurt, where vast quantities of artificial fertilizers are manufactured, the exclusion of chloride of sodium, or common salt, is now considered necessary, and the value of a manure is made to depend upon its percentage of potash.

We have been led to make these observations after perusal of an able lecture on "Salt and its uses in Agriculture," by Professor Gossman, of the Mass. Agricultural College. Dr. Gossman concludes his remarks as follows: "The safest and cheapest way of supplying salt to your farm lands, if at all desirable, is to feed it to your live stock, for natural channels of distribution are always the best."

SOMETHING ABOUT GASES.

The most attenuated condition of matter known to man is that of a gas. It is true that there is supposed to exist a kind of matter pervading not only all the inter-planetary regions, but the inter-molecular spaces of all bodies, whether solid, liquid, or gaseous. The name given to this hypothetical state of matter is ether, and if its existence be granted, its tenuity is so great that it has no sensible weight. Its existence is only a matter of inference.

The satisfactory manner in which the hypothesis of the existence of such an ether accounts for the transmission of light and heat, has led to its very general adoption in modern works on physics; and there seems nothing improbable in the idea that there may be states of matter, the density of which, when compared to the lightest of known gases—hydrogen—should be even less than that of hydrogen, as compared with mercury, the heaviest fluid known to exist at ordinary temperatures.

Admitting this, does not, however, relieve us from the consideration of other difficulties pertaining to the hypothesis of an ethereal inter-planetary medium. If such a medium exists, and if, as has been surmised, this medium be simply ordinary matter attenuated to such a degree as we have above described, it must possess the same physical properties as belong to gases.

Such inquiries are, however, speculative, and the object of the present article being to discuss in a popular manner some of the leading physical characteristics of gaseous bodies, we will turn our attention from hypotheses to demonstrated facts.

Gaseous bodies were formerly supposed to be of two kinds, permanently elastic gases and vapors, or such as were reducible, like steam, to the liquid form, by the loss of heat

and the increase of pressure. Professor Faraday, however in a series of magnificent experiments, proved that such a distinction had no foundation whatever. He not only liquefied but solidified many gases that had been deemed permanently elastic, and these experiments have been repeated and extended by other investigators, until the belief now obtains that no particular state, whether solid, liquid, or gaseous, is specific to any kind of matter, and that these states depend solely on the relations of the molecules of bodies to heat.

The converse of these experiments, that is, the changing of solids and liquids to a gaseous state, has been performed with nearly every known solid or liquid, and the colors which these gases impart to the blow-pipe flame, and the colors and positions of the peculiar lines or bars, formed by passing the light of such colored flames through a prism, and throwing the beam of refracted light upon a screen, have been found to indicate the nature of different substances with the utmost delicacy. This method of determining the presence of substances by the examination of the effect which the presence of their vapors produces upon the light emitted by burning alcohol, gas, solar light, etc., is called spectrum analysis; and the instrument employed in making such researches is called the spectroscope.

An entirely new department of chemistry has grown out of the extension of the use of the spectroscope to the examination of the light emitted by the heavenly bodies, and such examinations have led to the belief that the elementary substances as we know them by close examination in the chemical laboratory, are distributed throughout the universe.

One of the most prominent physical characteristics of gases, is their great elasticity. It is this property upon which the usefulness of steam as a motive power in a very great measure depends. In fact, gases and non-viscous liquids are the only perfectly elastic bodies.

The theory of the elasticity of gases is comprised in what is known as *Mariotte's Law*, which is "that in an elastic fluid subjected to compression, and kept at a constant temperature, the product of the pressure and the volume is a constant quantity;" or, in other words, the volume is inversely proportional to the pressure. This law does not, however, hold good for all pressures, nor for all gases. In those most difficult to liquefy, as oxygen, nitrogen, or their mixture in atmospheric air, etc., the law holds good, but in such gases as chlorine, steam, and others that can be liquefied under such pressure as can be practically brought to bear upon them, departures from the law are observable, increasing as the gases approach liquefaction. Such variations are, however, of little practical importance, and the law as enunciated is sufficient for all ordinary purposes of computation.

Another prominent characteristic of gaseous bodies is their affinity for water. Water absorbs all gases to a greater or less degree. The colder the water and the greater the pressure the more gas will be absorbed, and *vice versa*; but the volumes of different gases which water and other liquids will absorb, vary greatly. Gases are also absorbable by solids to a large extent, wood charcoal and animal charcoal being some of the most powerful solid absorbents.

But perhaps the most remarkable property of gases is that which gives rise to what is called diffusion. The heaviest gases when placed in contact with the lightest, do not remain separate like oil and water, but mingle and diffuse each through the other in defiance of gravity. This even takes place when the gases are separated by a porous diaphragm. A common experiment, illustrating this truth, is to fill a glass jar with carbonic acid and invert over it a jar filled with hydrogen, which is twenty-two times lighter than carbonic acid. In a very short time equal quantities of both gases will be found in each jar. This has led to the enunciation of the law that every gas comports itself toward every other gas as though it were a vacuum. Thus the presence of dry air in a vessel does not prevent, though it will somewhat retard the entrance of any other gas. As much of the latter will enter with the air present as would be the case if the air were exhausted.

Regnault was the first to prove that although the expansion of each gas is nearly equal for equal increments of heat when rising from different temperatures, all gases do not expand alike for a given increase of heat. We have said the expansion of each gas is nearly equal for equal increments of heat. For practical purposes this expansion may be considered as absolutely equal, as the differences are but slight, and only determinable by accurate experiment. The most important application of this law of expansion, is made in the steam engine, when steam is used expansively.

The distinction between vapors and gases has been, as we have said, virtually abandoned; but the term vapor is still commonly applied to such gases as are most readily reduced to the liquid state. Though it may seem to some an innovation to talk of steam as a gas, yet it is a gas, possessing the physical characteristics of all other gases, and must be considered as such to attain a perfect comprehension of its action as a motive power.

NEW MECHANICAL MOVEMENTS.

Perhaps no department of study is more improving to the inventive faculty than the study of mechanical movements—those minor machines which, combined, produce the various motions to be found in complicated machinery.

The mechanical powers, as they are called—*i. e.*, the lever, the inclined plane, the wedge, the screw, the wheel and axle, and the flexible band or rope—may properly be reduced to three—the lever, the inclined plane, and the band. For the wedge and screw are only modifications of the inclined plane, while the wheel and axle is a modification of the lever.

These three fundamental elements are therefore the basis of all mechanical movements, that is, combinations to produce certain movements of parts of machines. There are already a great number of these in use, and a still larger number which have never been much used, but there is little doubt that there are a great many more which are possible. The search for these gives rise to some of the most beautiful mechanical problems, as well as some of the most difficult. The solution of one of these was given on page 372, Vol. XVIII.

We propose now to enunciate a few such problems upon which our inventors may try their skill, premising that, as in the higher mathematics, the solution of a problem demonstrates its impossibility if it be impossible; so, if it can be satisfactorily shown that the problems here given are any of them impossible, that shall be considered as a proper solution.

PROBLEM 1.—Required to convert the rotary motion of a pulley into a horizontal intermittent rectilinear motion, first in one direction and then in the opposite direction, without the use of a pitman, pulley, toothed wheel, cam, cam groove in a pulley, or a flexible band, the first rotary motion to be constant and uniform. In other words, let it be required to move a piece of metal, wood, or other material, to a certain point where it shall pause, and then again move on a certain distance and again pause, and so on successively as far as desired, when it shall return to the point from which it originally started in the same intermittent manner and under the conditions above specified.

PROBLEM 2.—Required to produce a variable rotary motion in a shaft driven directly by a belt from a pulley having a uniform constant rotary motion, without the use of anything but the one belt and the two pulleys; no cone pulleys or their equivalent to be allowed. All the motions to be continuous and in the same direction.

PROBLEM 3.—From a reciprocating body to communicate reciprocation to another body, so that the second shall make four reciprocating movements for every reciprocation of the first; the motions of these bodies to be in lines parallel to each other, and the pieces to be connected by only three moving parts, which parts shall be neither wheels nor pulleys of any kind, and no inclined planes, cams, belts, or flexible cords, cranks, or bell cranks, to be allowed, and no radial motion from a fixed center in any piece employed.

This will do for the present. Some of these problems are, perhaps, too difficult for a beginning, but they are all capable of solution. It is not at all improbable that the effort to solve them will lead to some useful inventions. The author of them made two useful applications of ideas suggested while attempting their solution.

The solutions offered may be given in simple diagrams accompanied with such description as may be necessary.

PROPOSED PLAN FOR PUBLISHING PATENT OFFICE SPECIFICATIONS AND DRAWINGS.

The speech of Mr. Jenckes, of Rhode Island, in the House of Representatives, on the 9th inst., in support of the House joint resolution providing for the publication of the specifications and drawings of the Patent Office, and the subsequent debate upon the subject, has placed the salient features of the plan in such a light that the public generally may comprehend its advantages.

It is proposed to abandon the publication and distribution of the annual reports as they are now published, and instead to place in the capital of every State, and in every city where a circuit Court of the United States is held, if it be not held in the capital, a complete record of the transactions of the Patent Office; the specifications in full and the drawings in full. Then the inventor has simply to take rail or boat, and visit the capital of his State, and he will have the same means of investigating what are the inventions of the country as if he came to Washington in person.

It is also proposed to furnish an equally perfect record to each public library in any part of the United States, which shall pay for its uniform binding and its transportation to the locality where the library is situated.

It is further intended to make this distribution weekly, so that the latest information relative to patents may be accessible to the entire country.

The disadvantages of the present system are great. It is confessedly expensive, incomplete, inaccurate, and inadequate to meet the needs of inventors.

The advantages of the new system are as obvious as the disadvantages of the old. The distribution being not a matter of favor, as now, the filed drawings and specifications will form a complete as well as an accurate and reliable record. Under the present system the distribution is very imperfect, so much so that complete sets of the reports since their publication in 1844, are rare outside of Government Departments, though not so much so as to justify Mr. Banks' statement in the debate referred to. Mr. Banks said that "Of all the million volumes that have been distributed, I do not believe that there is within the United States in the hands of any private citizen, unless he have some special Government advantages, a complete set of this encyclopedia of inventions. The chairman of the Committee on Printing tells me that there is not in the Patent Office itself, nor in the Library of Congress even, a complete set; and I do not believe that such a set exists in any one of the one hundred and four principal public libraries of the United States, which contain ten thousand volumes and upward. Now what a senseless practice is the distribution of this work, at a cost of \$235,000 a year, when the value of it is greatly impaired by the manner in which it is distributed."

We have a complete set of these reports, and they are of

great service to us. They are constantly sought by large numbers of persons interested, who daily visit our office to consult them. It is true, however, that only complete sets are of much assistance, and that the drawings are often so defective in their lettering as to mislead; and they are altogether too meager to give such information as will form a basis for accurate judgment.

It is claimed that the new system will decrease the expenses of the Patent Office for printing \$100,000 per annum, and it will also reduce the expenses of those who now have to go to Washington to pursue their investigations by requiring them only to journey a short distance to obtain the necessary information.

It is thought this plan would increase the confidence of capitalists and make them more ready to invest in really new and useful inventions, as they would easily be able to verify the value of an invention, so far as novelty is an element of value.

By means of the art of photo-lithography the drawings can be reproduced of half the present regulation size at an estimated cost of one dollar and fifty cents per hundred, and although the bill, in its present form, provides only for the publication of specifications and drawings after the publication of the report of 1868, it is estimated that all the drawings and specifications issued prior to 1870 might be reproduced in 300 volumes at a cost of \$200,000.

Mr. Jenckes performed an act of injustice in his speech toward honest and honorable patent solicitors, in making no distinction between them and such as do not identify themselves with the interests of their clients. No one knows better than Mr. Jenckes that this is unjust, and it is probable that his zeal in the support of his measure, betrayed him into an unguarded expression.

We heartily advocate the passage of this resolution; but we would have the plan extended to the publication of the specifications and drawings of all the patents which have been issued up to the present date; and it ought also to be amended so as to admit of the purchase at cost by such parties as are willing to pay for it in advance of publication. Many copies could thus be sold without increasing the cost to the Government, and a much wider circulation be given to them.

CONGRESS EXTENDING PATENTS.

In the House of Representatives on Friday, March 11, the following measures concerning patents were enacted:

Reports were made from the Committee on Patents by Mr. Jenckes adversely on the following applications:

For extension of patents of J. Carhart, of New York, and of Charles A. Pitcher, for the manufacture of brooms.

Bills were reported from the same committee allowing applications for the extension of patents as follows:

By Mr. Jenckes—Patent of Walter Hunt for the manufacture of paper collars. Passed.

By Mr. Calkin—Patent of Timothy D. Jackson for improved annunciator or bell-telegraph for hotels, etc. Passed.

By Mr. Myers—Patent of Thomas Thompson for improved machine for folding paper. Passed.

Also, patent of William Montstow for improvement in revolving fire-arms. Passed.

Also, patent of John Edgar for self-regulating wind wheels. Passed.

Also, patent of Tobias J. Kindleberger for improvement in cider mills. Passed.

By Mr. Calkin—Patent of John Young for improved washing and wringing machine. Passed.

By Mr. Johnson—Patent of Jonathan Haines, for harvest or header.

After discussion by Messrs. Johnson and Cullom in support of the bill, and by Mr. Tanner in opposition to it, the bill was passed.

By Mr. Jenckes—Patent of Augustus R. Moen for improvement in the construction of basement, cellar, conduit, and other like walls, so as to render them impervious to water. Passed.

Also, patent of Robert Burns Goodyear for improvement in power looms.

Pending its consideration the morning hour expired, and the bill went over to the morning hour next Friday.

If this kind of special legislation by Congress is to continue, the statutes relating to extension of patents might as well be repealed. Of what use is it to absorb the time of the Commissioner, who knows what he is about, in the examination of applications for extension, when a successful appeal from his decision can be made to Congress through the aid of expert lobbyists, thus practically taking the power of granting or refusing extensions out of the Commissioner's hands? We have always opposed this sort of legislation.

TO CLEAN PAINT.—There is a very simple method to clean paint that has become dirty, and, if our housewives should adopt it, it would save them a great deal of trouble. Provide a plate with some of the best whiting to be had, and have ready some clean warm water and a piece of flannel, which dip into the water and squeeze nearly dry; then take as much whiting as will adhere to it, apply it to the painted surface, when a little rubbing will instantly remove any dirt or grease. After which wash the part well with clean water, rubbing it dry with a soft chamois. Paint thus cleaned looks as well as when first laid on, without any injury to the most delicate colors. It is far better than using soap, and does not require more than half the time and labor.

PICTURE frames or frames for looking-glasses may be easily coated with bronze by a thin plate of liquid quartz upon which a fine bronze powder is dusted.