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Resources of America.

The agricultural capacities of the United States are unlimited. Our Republic possesses every variety of soil and every variety of climate. The mineral and agricultural resources of any country constitute the basis of its wealth. With natural resources and an industrious and virtuous population any country will assuredly become great and rich. Judging from the history of the past, the Republic of the United States will be in 1948 the most gigantic, rich and powerful empire that ever existed.

At the present moment there is a sleepless and untiring energy displayed in every department of science, manufacture and agriculture. Railroads and Telegraphs are making an end of time and space as it regards intercourse. Factories are springing up on every mountain side and in every valley. The lovely waterfalls of the North and the South that had sung their wild songs responsive only to the winds and the woods for centuries, are now wakening the merrier music of the shuttle and the spindle to clothe our citizens with drapery more fine than that worn by ancient princes. The bosom of mother earth is pierced with a thousand mines and from her inexhaustible stores, treasures of metals, and what is more valuable still, a power unknown to the most mighty philosopher of old, is brought from thence, which in the shape of coal propels the steam engine and enables the steamboat to march over the billow by a breath of the very water she dashes from her bucket.

Agriculture is not neglected amid commercial, mining and manufacturing enterprise—in fact our agricultural enterprise is the root—the soul and body of all the other departments of our national prosperity. The cotton, sugar, hemp, wheat, corn, lumber and the numerous products of our endless variety of climate and soil create all our commerce and all our manufactures. The trade of town and country is just in proportion to the resources of the country as developed by an ingenious and industrious people. The reason why the United States has become the first agricultural nation in the world in the amount of her products, and the second in commercial prosperity, is because she possesses unlimited natural resources and a people capable of developing them by an industry that never tires and an ingenuity as soaring as the eagle that rides on the sunbeam and sails on the cloud.

Copper.

Copper is a word derived from the Island of Cyprus, where it was first wrought by the Greeks. To obtain it pure when extreme pureness is required, is to dissolve common copper in nitric acid, then dilute the solution, introduce a piece of iron and the pure metal will be precipitated, when if there be any particle of the iron left it can be removed by washing with weak sulphuric acid. These acids have a greater affinity for the iron than the copper, and this is the effect of that wonderful agent, electricity. Copper is negative and iron is positive. Copper was used and known by the ancients previous to the discovery of malleable iron. The weapons of the ancients were sometimes of a very fine temper and very hard, but they were made of alloys which in different component parts were called bronze. From the negative nature of copper, a correspondent of the Philadelphia Ledger recommends its general use for steamboilers and suggests the coating of iron boilers inside with copper. This can be done by filling the iron boiler with the sulphate of copper and depositing the copper on the iron by the agency of the galvanic battery. It is a good suggestion and we may yet live to see it in universal practice. At present copper is used for an endless variety of purposes. It is used as a medium of exchange in coin. It is used in the art of dyeing for browns and blacks; it is used in medicine and

the mechanic arts for kettles and boilers, but especially as an alloy; it is valuable for the number of its mechanical mixtures, to which we shall direct attention in some future practical articles.

Expansive Steam.

A knowledge of the advantages of working steam expansively, although understood by all engineers, yet may not be uninteresting to many others, especially when made plain—a thing which too many abstruse geniuses never fail to make a wonder of, where ne'er a wonder should be. When steam is used from the boiler, say at 30 lbs. to the square inch, for each foot, and throughout the entire stroke, which is 10 feet, we shall have a total amount of power, 30 lbs. multiplied by 10 feet=300 lbs., which if we take 10 lbs. of coal to generate that amount of steam power, then we have 300 lbs. divided by 10 lbs coal, showing that 1 lb. of coal gave 30 lbs. of power. Now suppose the steam from the boiler was the same as before, and being admitted in the same cylinder, but was cut off when the piston had gone only 6 feet, then the 30 lbs. for 6 feet of the stroke would be 180; now by taking the 180 lbs. as a constant number, we divide it by 7, the 7th foot of the stroke of the piston, we have as the expansive force of the steam—

Different feet strokes.

- 10, 9, 8, 7)180=25.5
- 8)180=22.4
- 9)180=20.
- 10)180=18.

Add for 6 feet of stroke 180.

Pounds steam, 265.9

In other words, by cutting off the steam at three-fifths of the stroke there is a whole power of 265.9 lbs. of steam at the expense of 6 lbs. of coal, or a loss of only 34.1 lbs. of steam for a gain of 4 lbs. of coal—nearly one third—a gain for every pound of coal of 14.3 lbs of steam, as follows:—

- Full stroke, : : 10)300. =30.
- Cut-off and expansion, 6)265.9=44.3

Minus full stroke, : 14.3 lbs.

O gain cut-off, : 14.3 lbs.

A saving of 16.4 per cent of fuel but not, as some have wrongly expressed it, “a gain of power in the stroke.”

Usefulness as belonging to Invention.

The eighth section of the Constitution of the United States authorises Congress—

“To promote the progress of science and of the *useful arts* by securing for limited times to authors and inventors the exclusive rights to their respective writings and discoveries.”

The sixth section of the Patent Law of 1836 intended to carry out this Constitutional power designates as proper claimants of Patents—

“Any persons having discovered or invented any *new and useful* art, machine, manufacture or composition of matter, or any new and useful improvement, on any art, machine, manufacture or composition of matter not known or used by others before his or their discovery or invention thereof, and not at the time of his application for a patent in public use or on sale with his consent or allowance as the inventor or discoverer.”

The Act of 1842 authorises the issuing of patent rights for 7 years, and at half the fee prescribed for others cases for new and original designs for manufacturing or printing,—for new and original designs for busts, statues, bas reliefs or compositions,—for new and original impressions or ornaments to be placed on any article of manufacture,—for new and useful patterns, prints or pictures for any article of manufacture,—or new and original shape of any article of manufacture.”

Direct utility then in connection with novelty is requisite in respect to so large a class of applications for patents, that it is important to ascertain the true meaning, scope and operation of the term “*useful*” as employed in the above cited portion of our Constitution and Laws.

What is the “legislative” construction given to the term “*useful*” as employed in the Patent Laws?

The two Acts to which we have referred should be considered in connection,—and the meaning of Congress deduced from their provisions taken as a whole.

An examination of the act of 1842 shows that Congress intended to protect not only those inventions which are useful in satisfying our physical wants, and in promoting the safety and prosperity of individuals and communities. The Act in question spreads its fostering wing so widely as to protect inventions which minister to the innocent pleasures of taste and imagination,—and which are fitted only to impart pleasure.

Every new invention which if rightly used, enhances human happiness without necessarily injuring morals,—whether the invention relates to a plough or a piano,—seems to be within the protection of our laws.

The liability to be abused, furnishes no valid objection to patenting an invention provided the invention be useful for any purposes. For what may not be perverted to wrong ends? The percussion cap so useful to the sportsman, may also be used by the assassin. In short, Congress seems to have construed the word “*useful*” in its broadest and most liberal sense. They regard it as synonymous with “*convenient*,” “*profitable*,” “*conducive to any innocent purpose*,” “*beneficial*.”

“It has been a point of some difficulty and discussion,” says Chancellor Kent, “to determine to what extent an invention must be useful to render it the subject of a patent. This will as a matter of fact depend upon the circumstances of each case. It must be to a certain degree beneficial to the community and not injurious, or frivolous or insignificant.”—[2 Kent's Commentaries, p. 369.

“All that the law requires,” says Judge Story, in the case of Lowell vs. Lewis—1 Mason's Reports, p. 182—“is that the invention should not be frivolous, or injurious to the well being, good policy, or sound morals of society. * * * It is enough that it be useful. How useful, is immaterial.”

A patented invention is deemed useful if it be not frivolous. The want of utility is a good cause for not *granting* a patent. But it is very doubtful whether such want of utility furnishes any ground of defence whatever to a party sued for infringing upon the rights of the patentee. If A. has manufactured an article patented by B,—he would seem to be precluded from saying that the article was worthless. If worthless or pernicious, why did he manufacture it? The plea of A. would conflict with his acts.—[Sec. 1 Peters' Circuit Court Reports, p. 403. *

Percussion Powder.

To the Editor of the Sci. American.

As you did not allude to any use having ever been made of Pulvis Fulminus, I supposed you would be interested in the contents of the annexed communication. I have had much to do with that article, and when I met my last disaster, it had become appreciated by a great number of hunters and sportsmen, and but for the introduction of Percussion would at this time be in universal use. I made a prodigious improvement in proportions and manner of uniting the materials. By previously mixing together the nitre and carbonate of potash I obtained an intimacy of union, never to be had by grinding. By the old process, given in your paper, it had only 3 to 3 1-4 times the speed in burning over gunpowder, by my improved process 8 1/2 times, which was prettily proved by a little implement, as follows:



A A, two little 3 inch cannons screwed into a standard graduated to 100. Holes were drilled so as to connect them to one another.—They were loaded with yellow powder and had a priming hole at the angle. Black powder is laid from B to C, and yellow from D to B. A slight side train was laid of yellow powder which on being fired at B, set both trains at the same instant when both pistols made but one report. The result was uniform and satisfactory. Although a rifle, well loaded, and fired by percussion, is discharged in a short time, yet I think I have never seen it done so suddenly as with yellow powder, when used, both as load and charge, in an open pan lock. And when a little care is taken to prick in

yellow priming through to a charge of gunpowder it will set the gun off as quick as percussion. Although 8 1/2 times quicker than gunpowder, it has no more than two-thirds its strength. Respectfully yours,

SAMUEL GUTHRIE.

Sackett's Harbor, N. Y.

Jethro Wood's Plough Patent.

The Legislature of this State has unanimously passed a resolution asking Congress not to renew this patent. This comes of wakening up our law makers to the interests of the whole people. We have been informed that some of Wood's relatives were in Washington lobbying for the renewal. We suppose that they were there only in the capacity of stool pigeons. The net, however, is not yet closed and speculators we hope will be deprived of the pleasure of growing fat on the inventions of others, especially those that slumber in the tomb.

Pearl Fishing.

A company is about to be formed in this city to operate on the coast of Cumana, under the lee of the island of Margarita, in 10° N. latitude. The pearl-beds are pronounced invaluable by Humboldt, the celebrated traveller, but through the disturbed condition of the South American States, and their separation from Old Spain, they have been undisturbed for about two hundred years.

A company for Mackerel Fishing would be of infinitely more advantage to the country than for pearl fishing. Gold and silver are valuable in the arts, but we would like to know what benefit is to be derived from an oyster excrement.

A Kara Avis.

Rev. Mr. Kendall, of Verona, New York where he has a salary of \$400, has lately received a call from the Spring street Church in this city, with a salary of \$1500, and although very earnestly pressed to accept the city pulpit, he has declined absolutely.

Modesty.

Our young friend of the Farmer and Mechanic has become very modest in his obligations. We had no idea of seeing our Metallic Bath Table stuck under the nose of his *Mechanics' Note Book*, after being prepared for us with great care and at some expense. It is an exceedingly amiable trait of character to wear unblushing other people's honors, and such a trait of character the Farmer and Mechanic is bound to carve out for itself.

Evil Speaking.

Whenever we hear a man speak disparagingly of his neighbors and take every opportunity to wound their feelings, we consider that man as yet in “the gall of bitterness and in the bonds of iniquity.”

There is not a single drunkard in the village of Boonton, N. J., comprising eight hundred inhabitants, nor a tavern where people obtain intoxicating drinks.

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