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THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 426,

For the Week ending March 1, 1884.

Price 10 cents. For sale by all newsdealers.

ROBBERY AS A BASIS OF PROPERTY RIGHT.

It is commonly believed that the natural tendency of legislation in all civilized countries is toward a reversal of the "good old plan, that he shall take who has the power, and he shall keep who can." And so it is; but unfortunately the tendency is not universal. Under the specious plea of correcting alleged wrongs, it is still possible for legislators, presumably civilized, to propose (if not to secure) the enactment of laws which do not help to make it easier for men to retain and enjoy what is rightfully theirs. Nevertheless, one cannot but feel a degree of surprise at the sight of legislators calmly considering acts which would put a premium upon robbery, by making it impossible for the owner of any species of property to reclaim it after it had been taken from him by force or fraud; and that is precisely what is aimed at in bill No. 1,558, now before the Senate.

This is a strong assertion, yet the facts will bear it out; for the bill frankly discriminates in favor of the receiver of (admittedly) stolen property against the claims of the real owner.

The bill in question was introduced Feb. 16, by the Hon. D. W. Voorhees, Senator from Indiana, as a substitute for the bill (S. 1,115) to amend Section 4,919 of the Revised Statutes relating to the recovery of damages for the infringement of patents, the text of which is nearly the same as House bill 3,925, printed in the SCIENTIFIC AMERICAN for February 2, 1884. The proposed substitute reads as follows:

"*Be it enacted, etc.*—That it shall be a valid defense to any action for an infringement of any patent, or any suit or proceeding to enjoin any person from the use of a patented article, that the defendant therein, or his assignor, purchased the patented article for use or consumption, and not for sale or exchange, in good faith and in the usual course of trade, without notice that the same was covered by a patent, or without notice that the seller had no right to sell such article: and in all such cases notice received after such purchase shall not have the effect to impair in any way the right of such purchaser as absolute owner."

In brief, though the seller of a patented article have no right to sell, the sale shall be valid and the real owner cannot reclaim his property.

All the talk of "good faith," "the usual course of trade," "for personal use," and all that, goes for nothing, except to cover the naked injustice of the closing provision. In not one case in a million could the patentee prove an absence of good faith or the existence of collusion between the fraudulent seller and the "innocent" buyer, whatever the relations of the two might be.

The courts have held the property rights of patentees to be as sacred and inviolable as any other species of property rights; and public interest demands that they shall be as scrupulously respected and quite as carefully guarded, for they contribute their full share to the public well-being. Exact figures cannot be given; but anyone who will inquire into the value of property vested in, or contingent upon, patent rights on New York Island alone—property whose value would be unsettled or destroyed outright by the proposed legislation—will soon arrive at a sum that would go far to purchase the entire farm property of whole States.

On the score of sound policy, not less than that of common justice to inventors and patentees, Congress ought not to play fast and loose with interests so gigantic and vitally important. The public injury might be more readily apparent, but it could scarcely be greater, if cattle, or horses, or houses, or lands were similarly deprived of legal protection, by enabling any thief or trespasser to give a valid title to any one he might induce to buy of him in "good faith."

If the spirit of the proposed bill were not so plainly in harmony with that of other bills, on this and other subjects, proposed or enacted by the present Congress, one would be almost forced to think that its purpose must be not to secure a change in the cited section of the Revised Statutes, but rather to expose the inherent viciousness of other patent bills that seek, though less frankly, the same end.

It would be too hazardous, however, to treat the measure other than seriously, in view of the manifest temper of certain members in both houses of Congress, and the apparent inacquaintance of others with respect to the importance of our manufacturing interests or their intimate dependence on the integrity of the patent laws.

LOOSE PULLEYS, OR IDLERS.

The common practice of running a loose pulley on the shaft, as a wagon wheel runs on its axle, is one full of annoyances and is anything but a permanency in use. A loose pulley, or an idler pulley, should have its separate shaft with its separate journals. The shaft upon which the fast pulley is fixed is of too small a diameter to act as the axle for a pulley which revolves rapidly, and the hub of the pulley is too short to withstand the leverage strain of the broad rim, particularly when this strain is intensified by that of a long, heavy belt. The better practice, wherever it is feasible, is to mount the idler pulley on a short independent shaft with its own independent journals. One of these journals may turn in a projecting portion of the hub of the fast pulley, so that the rims of the two pulleys may come together, or the idler shaft may be supported by two boxes outside the loose pulley.

With this arrangement there is no pulley turning on a shaft and "wabbling" from side to side by the unequal and changing pull of the belt, making a wear that will insure a rattling.

Another device is practiced by a first class mechanic, which is to substitute the turned hub of the fixed pulley for the shaft as an axle for the loose pulley. The result of this method is to give a large bearing for the loose pulley hub. To accomplish this result the fast pulley is cast with the rim entirely on one side of the arms and the hub extending beyond the other side of the arms sufficient to receive the hub of the loose pulley its entire length, while the rim and hub of the loose pulley project from the same side of the arms of the loose pulley. This arrangement gives a very large bearing for the loose pulley hub—the outside of the finished fast pulley hub—and also saves the width of one pulley in the projecting end of the shaft, as it need come no further through the box than to receive the hub of the tight pulley.

In all cases it is a good plan to have the loose pulley slightly smaller in diameter than the fast pulley, to relieve the tension of the belt; and when the fast pulley is slightly larger, it will receive the belt and start the work more readily.

HOW KNURLS ARE MADE.

Knurls may be purchased ready made and of varying sizes and patterns at the tool stores, but it not unfrequently happens that these stores are not at hand or that their stocks are too limited for choice. But knurls of the ordinary cross flutings, for use for knurling thumb nuts and screw heads, may be readily produced on the lathe with the help of the ordinary screw chasing hob. To do this turn up the blank knurl, of soft iron or annealed steel, drill it, and mount it as usual in its handle, so that it turns freely on its pivot; place the hob on the lathe centers, dogged to the face plate, as usual. Place a lathe tool or bar of steel in the tool post for a guide or rest, and present the knurl on its side so that its pivot is vertical. Bear against the hob as for forming a chaser, and the threads of the bob will rotate the knurl as the cutting proceeds. If the knurl lies square on its side, the flutings will be slashed at the same inclination as the pitch of the thread of the hob. Should a greater slash be desired, or no slash at all, the result may be produced by inclining the face of the knurl, and this inclination can be assured by filing its handle where it rests on the guide. If the knurl has a rounding face, the inclinations at which it is presented to the hob must be changed as the work proceeds, to correspond. If the knurl is to have a concave face, the concavity of the knurl's face and the diameter of the hob must correspond. Good soft iron, as Swede or Norway iron properly case hardened, will make as good knurls for brass or softer metals as steel. The grades of fluting of knurls produced in this way may be varied by using hobs of different pitches of threads.

TETANUS—LOCK JAW.

A recent correspondent inquires "How many days after an injury to toes or fingers is lock jaw likely to set in, and after how many days may the danger be considered past?" A disease involving such extreme peril as tetanus is very naturally viewed with proportional horror and apprehension, and instead of answering our correspondent in "Notes and Queries," we devote a little space to the subject here; and we shall confine ourselves, as he does, to that form of disease known in surgical practice as traumatic tetanus, as that is the only one popularly recognized.

It is well to correct at once an impression which is very common and which causes much needless alarm. It is the general belief that a severe, and especially a lacerated, wound is extremely apt to cause lock jaw: a hurt, for instance, from a "rusty nail." Now, this not at all true. It will, by most people, be deemed very strange, but it still is strictly true, that tetanus has very little to do with the severity of the injury; a single smooth cut (for example, a slight surgical operation) may cause it, as may also a blow even of no great violence. On the other hand, the most terrible mangling and tearing may go free. And so extremely small is the number of cases, in comparison with the multitudes of injuries daily received, that every effort ought to be made to quiet the popular apprehension. Cases of tetanus do occur, but they are very few in their sum total.

There can be no question that the physical condition of the person injured has much more to do with the development of the disease than has the severity of the injury. Except in special localities, it is almost impossible to induce tetanus in a person who is in good, vigorous health. Depressing causes of every sort tend to its origination, and hence the well known fact that injuries and surgical operations during the exhaustion of a severe military campaign develop tetanus at a very alarming rate. The disease is purely nervous in its origin and its nature, and because of this whatever lowers the nerve force, that is, the life force, favors its inception. But though nervous only at first, organic changes in blood vessels (and probably also in the blood) as well as other tissues speedily follow, and these then play their own destructive part.

Tetanus may follow an injury almost instantly, certainly within an hour, though this is not common, and it may be delayed several weeks. Instances are on record where it has waited a full month, but this is also not common. From the third day to the tenth is the range in general. After the tenth day few cases occur, and even if they do, the danger is not so great, for they are milder in proportion to the lateness of their origin, and many such recover. Of those beginning early the prognosis is frightfully unfavorable.

Some writers even go so far as to say that "it is doubtful if there be any authentic case of recovery under such circumstances," but this is certainly not true, as we have personal evidence to prove recovery is possible.

The treatment must of course be left to the best skill to be obtained in the emergency. Opium in very large doses, together with proper care of the wound, is about all that would lie within the reach of a non-professional person. Chloroform or ether might be inhaled, by means of a napkin or sponge, to check the violence of spasms, but their effect is quite transitory, and to be of any real efficiency must be pressed more urgently than any one but a person thoroughly trained would be likely to do.

PATENT BILLS IN CONGRESS.

To the Editor of the Scientific American:

Noting in issue of Feb. 2 the short article, "A Bill to Reduce the Lifetime of a Patent to Five Years," as comment upon H. R. 3,617, introduced by our own representative, the Hon. Jno. A. Anderson, I was the more fully impressed with the growing importance of this most frantic and insane cry of the general public against the patent laws, and begin to feel the necessity of inventors and all others interested in the advancement of the arts and sciences doing something. The trouble lies in the fact that those who should be most interested in having wholesome and just patent legislation for their own protection and that of the general public really give the least attention to it. We leave these vital and all important matters to our legislators and senators, who as a rule do not come from the class fully knowing the needs of the case, and thus we have imperfect laws upon the subject; and under the press, as at present, of popular excitement and indignation on part of farmers and the public generally against so many recent patent frauds, patent abuses, and royalty jumpers, especially in the West, we are liable to have some serious mistakes made, and our patent system partially if not wholly crippled, by hasty and inconsiderate amendments under these circumstances. And the matter coming so close home as to have my own townsman introduce so objectionable a bill, I feel that it at once behooves those interested to wake up and see if there is not really some cause for dissatisfaction, and if so what it is; and to suggest from a just and mechanical standpoint some reasonable remedies. And in pursuance of such motive I desire to do my little share. It suggests itself to me, and has for a long time, that our present laws are all right so far as they go, but are by no means sufficient to fully protect both the inventor and the general public. The original intent and purpose of our laws was evidently to protect the inventor, that is, to pay him for his work and study; and for the free publication to the world, the result of his work and study, he should be protected for 17 years in the exclusive use, etc., of his invention. But as our country grows broader, and varied interests more developed, we find the general public requiring some protection as well. Now, how can it be arranged that the inventor shall be fully and amply protected in his rights, and at same time the general public not be put to great annoyance and inconvenience? Certain it is our present laws do not do this; and further, the interests of the public are generally paramount to those of the individual.

But let us see. The policy of our system is to regard the rights of the inventor as what is termed *property, i. e.*, that which can be *bought* and *sold*—something that can be made the subject of ownership and personal control. Now, a horse is property and is so regarded; is capable of being sold, and also of being *stolen*. When any one appropriates to his own use another's horse, he steals—is a thief—and the law says he shall be tried as a *criminal* for a *crime* against the *law, not against* the individual, and on conviction shall be punished by fine and imprisonment. It is not so with a patent, or rather with rights conferred by the patent laws. Why should it not be? Again, if a man falsely and knowingly represents himself to own or control property which he does not, thus interfering and injuring the rights of others and the public, he is a criminal. Therefore *my* suggestion as a remedy for most of the evils, I think, of our present system would be to place the right of property under patents upon same footing as other property rights, and would call for legislation making it a criminal offense, punishable by fine and imprisonment, for any one to willfully and knowingly make use or vend any article or process upon which a valid patent existed, and would further make it a criminal offense for any one to claim rights protected by letters patent willfully and knowingly (thus preventing the public use of such article), unless he really had a valid existing patent.

And to simplify doubtful cases, it would be well to arrange a means for knowing promptly whether a claim made by any one to patent rights was valid or not by a *writ of inquiry* instituted before a proper court provided for the case.

This seems to me a more tangible means of correcting abuses of our patent laws than any other way, for in no way can we better protect the rights of property in anything, whether it be an invention or a horse, than by making the appropriation or wrongful use of such property a criminal offense. Whether this is the *best* course or not, we must see; but I am convinced of one thing, and it is that the mechanical world must take hold of this question and have some voice in the matter, or there is grave danger of a complete nullification of the very system which has done most for our country during the last fifty years.

SAM. KEMBLE, JR.

Manhattan, Kansas, Feb. 4, 1884.

[Our correspondent is well known as an enterprising manufacturer and inventor. The grant to him of patents for his inventions has enabled him to introduce and put into successful operation an improved industry, thus giving employment to many persons and contributing to the prosperity of his town and State. In the same manner, by the efforts of inventors, fostered by the patent laws, thousands upon thousands of industries have been established in all parts of the country; and as a result the United States is to-day probably the most prosperous nation in the world. Her agricultural products have reached enormous proportions, owing chiefly to the labor saving machinery which patentees have studied out and supplied to the farmers.

In view of such considerations, it seems almost like an insult to the common sense of the nation for honorable members of the House to declaim against the patent laws and strive to pass enactments that will cripple and destroy industries created by those laws. Think of the votes given in the House January 21, in favor of the passage of bill H. R. 3,934, which forbids the inventor from recovering damages for the use of his patent—114 ayes, 6 noes, 200 members not voting; and not a single man with pluck enough to stand up and breathe a word in behalf of his constituents, whose property and rights were by the enactment of the bill sure to be injured. The inventors, workers, and manufacturers of this country are strong enough to have not only one but many representatives of their interests in Congress; at present they have none—none but dumbheads. With a little unity of effort to see that no man is hereafter elected who will not pledge himself in advance to the encouragement of home industries and home inventions, there will be a different spirit exhibited in Congress; and inventive manufacturers like Mr. Kemble will not be obliged publicly to complain of their townsmen in Congress for introducing foolish bills.

Because there are thieves abroad who try to steal property is no reason why Congress should pass laws to prevent honest people from owning or defending property.]

FIRE DAMP EXPLOSIONS.

The Pennsylvania coal regions near Uniontown have again been the scene of terrible loss of life from fire damp explosion, by which nineteen men were lost on February 20th. Despite the fact that the "fire-boss" had made his usual inspection the night before and pronounced the mine safe, events nevertheless showed that such was not the case. The accident, on the face, seems to have been the result of overconfidence, since it appears that the inspection was made about 12 hours before the accident occurred. The mine had always been considered as a "safe" one, which no doubt accounts for the laxity in examination. But it nevertheless points to the fact that even the safest coal mines need constant watching to prevent accidents of this sort. Nor does it appear that any of the appliances for automatically showing the existence of fire-damp were in use. It would be unfair to single out this particular mine as being derelict in that respect, since hundreds of others are similarly unprovided; but that does not alter the fact that they ought *all* to be provided with apparatus for automatically announcing the presence of fire-damp, of the mere existence of which some mine owners seem to be in total ignorance.

Methanometers, as such instruments are called, have been devised, depending both on the physical and chemical qualities of the dangerous gases which occur in mines, and although they have not yet come into extended use, there is no reason why they should not. Mine owners may object to the score of expense, but the loss incurred by a single disaster might many times overbalance the cost of installing a system of fire damp detecters.

FIRST STEAM FIRE ENGINE.

To the Editor of the Scientific American:

On page 102 of the current volume of the SCIENTIFIC AMERICAN appeared a short article under the above title, in which you say, "We believe the first steam fire engine was tried in New York in 1842." You are nearly correct.

The alarming frequency and extent of fires in the city of New York during the winter of 1839-40 caused the attention of the citizens generally, and of the insurance companies in particular, to be directed to the subject of providing more efficient means for extinguishing fires than then existed.

At the suggestion of the underwriters, Paul Hodge, a machinist in this city, constructed a steam fire engine which was publicly tested in front of the City Hall late in a fine afternoon in March, 1841. It was a failure, as was demonstrated at the fire in the building of Harper Brothers in 1842.

Meanwhile the Mechanics' Institute of the City of New York had moved in the matter. In the spring of 1840 its board of directors (of which I was a member) offered its gold medal, the highest honor within its gift, as a reward for the best method for applying steam to the propulsion of the fire engine. The reward was won by the now venerable engineer and inventor Captain John Ericsson, before midsummer that year. The Committee on Arts and Sciences of the Institute, after a careful examination of several plans and specifications offered, made an elaborate report in favor of the one presented by Ericsson. In that report was the following paragraph:

"The points of excellence as thus narrowed down were found to belong in a superior degree to an engine weighing less than two and a half tons that, with the lowest estimate of speed, has a power of 108 men, and will throw 3,000 lb. of water per minute to a height of 105 feet though a nozzle 1½ inches in diameter. By increasing the speed to the greatest limit easily and safely attainable, the quantity of water thrown may be much augmented."

Captain Ericsson had presented a beautiful drawing of his engine and several illustrations descriptive of its structure. His letter accompanying the drawings and specifications is dated July 1, 1840. At that time the late Professor James J. Mapes was conducting the *American Repertory of Arts and Science.* I reduced for him to the size of his paper (octavo) the drawings of Captain Ericsson, and engraved them. These appeared in the *Repertory* for October, 1840, with full descriptions by the inventor. In November, the same year, these engravings and the descriptions appeared in the (illustrated) *Family Magazine,* published by Justus S. Redfield, of which I was then editor and illustrator. They appear on pages 224-226 of the eighth volume of that work.

Mr. Hodge's steam fire engine, which appeared very much like a locomotive as I saw it at work in front of the City Hall, was finally bought by a packing-box manufacturer, who used it as a stationary engine.

"The introduction of the steam fire engine into the city of New York," says Mr. Sheldon in his "Story of the Volunteer Fire Department," was delayed several years through the opposition of the volunteer firemen, who had the foresight to recognize it as their most formidable foe." If three or four men can handle a machine," they said, "what is the use of having sixty men and numberless assistants to do the same work?"

BENSON J. LOSSING.

The Ridge, Feb. 16, 1884.

BEE CULTURE.

To the Editor of the Scientific American:

In the SCIENTIFIC AMERICAN for February 2 is an article taken from an Australian paper on "Bee Farming in New South Wales." As a practical apiarist of some twenty years' experience, I have come to the conclusion, after reading the above mentioned article carefully, that our system of bee culture in Canada and the United States is considerably ahead of the Australian system as applied on the "bee farm" spoken of, and also of the German system of which it is said to be a copy.

In the first place, our styles of movable frame hives are evidently superior to theirs. The frame which the German holds in his hand in the illustration is a clumsy looking affair, and would be promptly discarded as such by any first class Canadian or American bee keeper. It is without bearings, and without the half inch bottom-piece projections which so much facilitate the handling of the frame, and effectually prevent the crushing of odd bees in taking out and putting in. The hive they use is evidently as unwieldy and clumsy as the frame that belongs to it.

And what American bee keeper wouldn't smile at that "swarming bag" as "a great improvement"! Just imagine an apiary of say 100 colonies depending upon the "swarming bag," or a score of them, during the swarming season! The whole twenty bags with twenty men behind them would do but small business under such circumstances; whereas, in our system of queen "clipping" and judicious manipulation, two or three expert hands can attend to that number.

And, then, instead of having a convenient little hand smoker by his side, like us, he smokes his pipe to mollify the bees. The tobacco pipe is no necessary part of bee culture, and the teaching that it is, is bad moral precept as well as bad science.

This writer says: "When the queen bee hatches out of the cell, she makes a flight (the only flight of her life) in order to meet a drone or male bee."

This statement is erroneous, as every scientific apiarist knows. A few days after the young queen is hatched (usually from three to eight days after) she goes out for a flight, it is true; but if she fails during the first flight to meet the drone and become impregnated—as frequently happens—she repeats her flights until that condition is secured. Nor is that successful flight the last natural "flight of her life" by any means. She leads the first swarm from her hive, and repeats this every year, and sometimes twice a year, as long as she lives.

Quite true it is that the queen's wings may be clipped immediately after she becomes impregnated, to prevent her from all subsequent flying, but in such cases she is under the manipulation of the bee keeper in making his swarms *artificially.* The queen bee, in her natural state, flies first to be impregnated, and subsequently flies with every first swarm until she dies naturally or is superseded by the workers when she becomes unprolific.

ALLEN PRINGLE.

Selby, Ontario, February 14, 1884.

Limbs of Unequal Length.

A writer in *Nature,* a member of the Royal College of Surgeons, mentions that, of seventy well authenticated skeletons he examined, the lower limbs were equal in length in only seven instances, the right limb being longer in twenty-five and the left limb in thirty-eight cases. It is claimed that this will have the effect, where persons walk without knowing the direction from their surroundings, to make their step longer with one limb than the other, and thus travel in a circle, as people so frequently do when they get lost. In most of the skeletons above referred to the right arm was longer than the left.