of diameter large enough to cut through a wide or thick piece of lumber, there is a much lower limit to the economical and effective projection of chisel cutters from a head. One of the largest manufactories of agricultural and domestic machinery and implements in the country has used circular saws in this manner for years.

A MENACE TO PROSPERITY.

Sooner or later every act of Congress is brought to the test of Constitutional sanction or to that of practical working. If it fails in the one, it is invalid; if in the other, it is pretty sure to be repealed as soon as its vicious tendency is discovered. Temporary delusion or local or party prejudices may secure the passage of a bad law; but an unjust and impolitic law is not likely to long withstand the will of the multitude, who directly or indirectly suffer by it.

On this ground it is fairly certain that the invasion of the property rights of patentees threatened in certain patent bills now pending cannot long endure, even if by any misfortune they should pass both houses of Congress and receive the Executive signature. Nevertheless, in a single year, such laws as House bills Nos. 3,925 and 3,934 contemplate would prove very hurtful if not widely disastrous to national prosperity.

The influence of new inventions, as a factor of industrial development and national wealth, is sufficiently conspicuous and generally recognized to make unnecessary any extended argument to prove it here. Nevertheless, a few facts bearing upon the question may be not without interest. Official inquiries made some years ago demonstrated the fact that something like nine-tenths of all the manufactures of the country were of articles recently patented or made by patented machines or processes. The same is not less the case to-day. The census of 1880 found our factories turning out products worth, that year, $5,369,000,000, by far the greater part being manufactures involving patent rights. In 1870 the annual products were worth $3,385,000,000, and in 1860 only $1,885,000,000. Thus, in twenty years, the increase had been nearly threefold. Meantime, the United States patents issued had increased in number from 26,641 to 223,210; now they approach 300,000.

Inventions were not the only, perhaps were not among the main, factors of this phenomenal industrial development, but they were an obvious and potent factor, since the advance was chiefly in industries called out or radically modified by recent inventions. In agriculture, the conditions of labor in which had been materially changed for the better by the inventor's labors, the annual product had increased in value from $1,400,000,000 in 1860 to $1,800,000,000 in 1870 and $2,200,000,000 in 1880. It may be a surprise to some to note that the manufactured products of the country now excel in value the agricultural nearly two and a half times. Both these great productive interests increased in value much more rapidly than did the population of the country, demonstrating a largely increased individual capacity of production, thanks wholly to the labors of inventors. In 1860 the population was 31,000,000; it rose to 38,000,000 in 1870, and to 51,000,000 in 1880.

Meantime the aggregate wealth of the country increased from $16,000,000,000 in 1860 to $30,000,000,000 in 1870 and $43,000,000,000 in 1880; all this in spite of the grievous lagacy of debt, depreciated credit, heavy taxation, and all the other evils incident to an exhaustive civil war.

Thus twenty years of unexampled progress were coincident with a period of unprecedented activity on the part of inventors. No one presumes to say that such progress was not desirable and beneficial, or that it could have existed or is likely to continue without a continuance of a like degree of activity on the part of those who more than any others make industrial progress possible.

Yet there seems to be in Congress a majority disposed to change all this by removing the great incentive to inventive effort, the hope of large reward through the inventor's absolute control of his invention for a term of years.

It seems to us that the country has not yet reached that stage of industrial pre-eminence and stability at which it can safely say to inventors, "There is no further need of your efforts," or "We cannot any longer afford to protect you in the ownership of your inventions."

Our example in the matter of liberality to inventors has set half the world at work along the same line of policy, looking to the development of useful arts and manufactures through increase of invention called out by guaranteeing to inventors some chance of profit from their labors. Everywhere (save in the House of Representatives) the tendency is to increase rather than lessen the inducements held out to inventors and introducers of new inventions; and other nations are not likely to take the back track if we do. Hitherto the advantages of liberal patent laws have been on our side; reverse this condition of things, and how long will we be able to lead in the industrial race?

Curiously, those legislators who profess to be most anxious to extend and expand our foreign trade, to build up an American mercantile marine, and all that, are those very ones whose anti-patent tendencies would soonest make it impossible for Americans to command their home market, much less invade successfully the neutral markets of the world in competition with our increasingly inventive rivals. The last improvement in any article commands the trade; if we cease to make these improvements, or the majority of them, our hope of ever attaining commercial eminence will have nothing to rest on.

But a more immediate menace to our industrial prosperity appears in those bills which take away the legal safeguards of the patent rights of those establishments which contribute most of the five billion dollars annual product—a product that would in two years purchase all the farms of the United States at their assessed value. Deprived of the power to defend in the courts their property against infringers, there would be little to induce manufacturers to undertake the commercial development of a large part of the most widely useful of all new inventions; and millions of dollars now invested in the manufacture of specialties would be lost, or withdrawn for safer uses. To take from the patentee the absolute control of the manufacture and sale of the article patented would in many, perhaps most, cases forbid his making any effort to develop it, or prevent his getting financial assistance for such work; for who would run the risk of proving the utility of an invention and making a market for it when the control would be wrested from him as soon as his pioneering and perhaps very expensive work was done?

The experience of Canada and other British colonies that hoped to enjoy "free trade in inventions," in other words get for nothing the inventions of other nations by allowing no patent rights for foreign inventions, is instructive here. Naturally the plan failed. So long as foreign inventions were free to all, no one cared or dared to bear the expense of introducing them; their manufacture began as soon as protection was given to manufacturers under patent rights, insuring an absolute though temporary control of any new industry they might establish.

Our manufacturing interests are too vast and too intimately dependent on patent rights to endure a wanton disturbance of such security without national injury. Even the threat of such disturbance should call out protests from every honest manufacturer.

THE FEBRUARY FLOODS.

At Wheeling, Pittsburg, and Cincinnati, great damage has been done this year by the rapid and great rise of the Ohio River and its tributaries. The snow fall had been large, and for nearly thirty days the temperature has been high, while a good deal of rain has fallen. This has, of course, made rushing torrents of all the feeders of the Ohio which rise in the elevated portions of Western New York, Pennsylvania, and Virginia. Nearly every year floods similarly caused do more or less damage, but last season's loss was so great on this account, that most people will be surprised that such great disaster could be inflicted in two following years. Last year the water in the Ohio at Cincinnati reached a depth of 66 feet; on the evening of Feb. 8, it had reached 63 feet, and gave promise of reaching the extent of last year's flood. Large numbers of people were compelled to leave their homes, most of the railroad communications of the city were interrupted, and there was great damage to property, although there appears to have been no loss of life.

At Wheeling one-half of the city was submerged, men, women, and children having to be removed from their houses by small boats stopping at the windows. About the railway stations only the stacks of the locomotives were to be seen, and numbers of factories were inundated.

At Pittsburg a large portion of the business part of the city was flooded. Between five and six thousand buildings were flooded, including the homes of 25,000 people.

Besides these principal losses there was much damage done at many smaller places on the Allegheny, Monongahela, and lesser streams, as well as on the Ohio; but the principal disasters have been on the Ohio and its tributaries.

A REMARKABLE PHENOMENON SEEN AT SULPHUR SPRINGS, OHIO.

A correspondent in Sulphur Springs, Ohio, refers to THE SCIENTIFIC AMERICAN of the 19th of January, which contained an account of a remarkable phenomenon seen in Porto Rico on the 21st of November. He also describes a wonder of the sky seen about that time in Sulphur Springs, though he is not certain as to the exact date. The phenomenon was witnessed by several observers besides himself.

The object was seen in the southwest in a vertical position. It consisted of a bright nucleus in the center with two tails, one pointing downward and the other upward. The nucleus, observed in a four-inch refracting telescope, under a power of 20, was ruddy in color and quite bright. Our correspondent incloses a sketch, giving the general view as it appeared to the naked eye, though the nucleus is represented as it was seen in the telescope.

We can give no explanation of this strange phenomenon. It was not a comet, or it would have been visible all over the northern world. Its conical form suggests the zodiacal light, and this soft, faint column of light has already been observed and described as unusually brilliant, as well as in advance of its usual period of visibility. It is seldom seen in this latitude until February and March.

The zodiacal light is a lens-shaped appendage of a mysterious nature surrounding the sun and extending a little beyond the earth's orbit. As seen from this planet, it extends upward from the sunset point nearly in a line with the ecliptic, or sun's path, reaching to a point in the heavens near the Pleiades, but has no appearance of a nucleus.

In the tropics the zodiacal light is almost constantly visible, and is sometimes sufficiently luminous to cause a sensible glow in the opposite quarter of the heavens. It is of a ruddy hue, especially at the base, where it is brightest, and puts out the light of the small stars. Sometimes undulations and flashes mingle with its soft, nebulous light.

We are, however, inclined to think that the celestial phenomena observed at Hamacas, in Porto Rico, and at Sulphur Springs, in Ohio, are connected in some unaccountable way with the superb afterglows that have formed a delightful feature of the season. Flashing lights, flaming banners, varied and fantastic cloud-forms, and every imaginable tint of color have diversified the sky, and made the winter of 1883–84 one long to be remembered for its brilliant sunsets and sunrises. The phenomenon is ascribed to the presence of volcanic dust, meteoric dust, or moisture. We may never discover the cause of the gorgeous illumination that has surrounded the path of the setting and the rising sun, but it will be long before we shall cease to remember its result.

PATENT OFFICE WORK OF 1883.

The Hon. Benjamin Butterworth, Commissioner of Patents, submitted his annual report to Congress Jan. 29. From it we learn that the total receipts of the office for the year 1883 were $1,146,240, and the expenses $675,234. There was in the Treasury to the credit of the Patent Office, at the commencement of the year, $2,205,471; and adding the excess of receipts over expenditures for the twelve months, this fund amounted, on the 1st of January last, to $2,676,476.

The total number of applications relating to patents was 34,576, of which 33,073 were for inventions, 1,238 for designs, and 265 for reissues. There were 2,741 caveats filed, 915 applications for registry of trade-marks, 834 for registry of labels, 18 disclaimers, and 640 appeals, making a total of 39,724 cases for investigation and action.

The number of patents issued in 1883, including designs, was 22,216, and there were 167 reissues, or a total of 22,383, against 19,267 patents and reissues in 1882, and 16,584 in 1881. There were also 902 trade-marks registered in 1883, and 906 labels, while 8,874 patents expired, and 2,366 were withheld for non-payment of the final fee.

New York State received the largest number of patents, 4,359, Massachusetts following with 2,173, and Pennsylvania with 2,168; then come Illinois with 1,792; Ohio, 1,604; Connecticut, 883; Michigan, 727; Indiana, 712; Missouri, 625; California, 596; Iowa, 445; Wisconsin, 394; Rhode Island, 327; and Minnesota, 310. The United States Army is credited with 6 and the Navy with 3 patents. According to population, the District of Columbia received one patent on the average for 318 inhabitants, Massachusetts one for 320, Connecticut one for 705, and Rhode Island one for 845, the fewest patents in proportion to population being issued to Mississippi, which received one for an average of 22,188.

The patents issued to citizens of foreign countries numbered 1,259, or 124 more than were so issued in 1882. England takes the lead with 435, followed by Canada with 251, Germany 235, France 179, Austria 33, Switzerland 22, and Belgium 20.

The Commissioner closes his report by directing attention to the inadequate room allowed for conducting the great and steadily growing business of the Patent Bureau, the insufficient force, and the necessity for paying better salaries to command a higher grade of talent in the examining corps. Similar views were expressed by Commissioner Marble last year, but they were unheeded, and the growth of the business now invests them with added force. It is not as though the cost of such additional help and improved service were to be made at the expense of the tax payers, for the funds therefor have already been accumulated from the fees paid by patentees, and it is no more than justice that sufficient should be appropriated from the receipts to insure the best possible administration of the business of the office.

Removing Stains from Cotton or Linen Goods, Curtains, etc.

Grease spots are best removed by soap; stains from oil colors, as a rule, do not resist the action of a mixture of soap and caustic potash. If spots of tar or axle grease are unaffected by soap, they will usually yield to the solvent action of benzine (so-called), ordinary ether, or of butter, which may afterward be removed with soap and water. For ink stains, dilute hydrochloric acid, which must subsequently be carefully washed out, will generally be found effectual. For the same purpose oxalic acid or salts of sorrel (hydrogen potassium oxalate) may also be employed, and that most economically, in fine powder to be sprinkled over the stains and moistened with boiling water.

The action of these solvents may be hastened by gently rubbing, or still better, by placing the stained portion of the fabric in contact with metallic tin. If there is much iron rust to be removed, dyer's tin salt (stannous chloride) will perform the work at less expense than the oxalic acid compound. Another solvent for such stains consists of a mixture of two parts argol with one part powdered alum.

Bilberry stains usually yield to the stains of burning sulphur. Stains caused by red wine, white wine, and fruit juices in general are treated successfully with salts of sorrel or with solution of hypochlorite of soda. The latter especially must be carefully removed when the ends have been attained.

Another well-tried plan, when space is available, is to spread the stained fabric on the ground in the open air, smear the spots with soap, and sprinkle ground potash or common salt upon them. Water is added and replaced when lost by evaporation. After two or three hours' exposure the whole fabric may be washed, and will be usually freed from its stains.—*Industrial Record.*