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(Illustrated articles are marked with an asterisk.)

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For the Week Ending February 13, 1892.

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A VIOLENT ERUPTION OF THE SUN.

A very remarkable eruption of a solar prominence was observed on June 17 of the past year, at the Haynald Observatory, Kalocsa, Hungary, by the eminent astronomer, Julius Fenyi. At about a quarter to six in the evening the first signs of the eruption were seen, and eighteen minutes later the great mass of intensely heated matter was found by spectroscopic observation to be in rapid motion. The enormous displacement of the spectrum toward the blue indicated an apparent shortening of the ether waves due to rapid motion of the glowing matter toward the earth. The prominence was essentially hydrogen. Several observations for velocity were taken, a direct maximum of 890 kilometers per second, equal to 553 statute miles, being obtained. The mass represented a suspended column, subtending 111 seconds, and rose while observed to a height subtending 256·9 seconds of arc. But the velocity was not only in the direction toward the observer, it also moved laterally and also in the meridian. Combining two of the different velocities, a probable resultant velocity of 1,014 kilometers, or 630 miles, per second is obtained, leaving out of account any movement in the meridian. This is sixteen hundred times faster than a cannon ball moves, and is enough to indicate the projection of the hydrogen into space out of the sphere controlled by the sun's attraction.

The cause of the outbreak and its final result are mysteries. M. Fenyi even appeals to electricity as the possible cause. The next query would be, Where did the great mass of hydrogen go? Did it fly through space like a drifting cloud, to be torn to pieces and distributed to different orbs as a constituent of their atmosphere? If it possessed quality enough of gravitation to keep its mass together, it might, when appropriated by some distant orb, gravely modify its atmosphere. It might find oxygen enough in such atmosphere to combine with and produce a conflagration to be revealed to our astronomers years hence, when the ether waves announcing the disturbance would have traveled to the earth.

From the magnetic records at Greenwich Observatory, in England, it appears that there was a marked magnetic disturbance, very short lived but clearly registered, at the time of a similar disturbance observed from Paris on the same day. But this was slight in extent compared to other perturbations.

THE CONGRESSIONAL REPORT OF THE COMMISSIONER OF PATENTS.

Two annual reports are made by the Commissioner of Patents, one in the middle of the year, July, to the Secretary of the Interior, the other in January, to the Senate and House of Representatives. The latter has just been presented by Commissioner of Patents W. E. Simonds, late Member of Congress from Connecticut. It is his first report, and is a most able and interesting document. The value and importance of the services rendered by inventors are eloquently set forth, and the measures necessary to enable the public to reap benefits from these services are described. Among the means to these ends the improvement of the Patent Office is shown to be essential. Its present crowded condition is disastrous to all concerned. The health and efficiency of employes are sacrificed for want of room for air and action. The report concludes with several valuable suggestions for modifications of the existing patent laws in the interest of inventors and the people. We make the following abstracts from the report:

The total number of applications for patents during the year 1891 was 40,452. Total number issued, 23,244. Total receipts, $1,271,285. Expenses, $1,139,713. Balance now in the United States Treasury on account of the patent fund, $4,004,317. The Commissioner says:

"As regards the rooms occupied by the examiners, the need is urgent. The cubic feet of space per occupant is 916 feet. Dr. John S. Billings, in his work entitled 'The Principles of Ventilation and Heating,' gives 4,200 cubic feet as necessary for each person in a room with 'ordinary ventilation' for two consecutive hours of occupancy. These examiners' rooms are occupied seven consecutive hours each day, with the exception of half an hour for luncheon. These rooms hardly attain what might be called 'ordinary ventilation,' for all of them are dependent upon the doors and windows for fresh air, except that one of them has a small ventilating register, which cannot be used, and five of them have grate fires, which to a degree assist the ventilation. The heating is attained in some rooms by the steam pipes, in others by hot air registers, and in still others by stoves. It is the rule rather than the exception in these rooms that the floor space is so occupied by desks and cases for papers that the occupants move about in them through tortuous lanes. Cases of drawings belonging to the patented files are necessarily located in large number along the sides of the corridors, where the public passes to and fro. This is unsafe and unsightly. This state of affairs not only puts unnecessary discomfort upon the examiners, but it also unfavorably affects their health, and, to a degree that is more than noticeable, prevents them from doing work to their full capacity."

The public benefits resulting from the policy of granting patents are sketched by the commissioner as follows: "The vast majority of our great manufacturing industries were originally based upon inventions recorded in the United States Patent Office. The following are a few and only a few of the American inventors whose reputation has become national and whose improvements have formed the foundation of manufacturing industries of great magnitude: John Fitch, Robert Fulton, and James Rumsey as to steamboats; Eli Whitney, as to the cotton gin; Oliver Evans, as to milling machinery; Amos Whittemore, Erastus B. Bigelow, and Barton H. Jenks, as to looms; Eli Terry, Ira Ives, Noble Jerome, and Chauncey Jerome, as to clocks; Peter Lorillard, as to tobacco making; E. I. Dupont de Nemours, as to gun powder; Jesse Reed, as to nail making; William Edwards, as to leather making; Jethro Wood, as to iron plows; Thomas Blanchard, as to lathes for turning irregular forms; Asa Spencer, as to geometrical lathes; Richard M. Hoe, Isaac Adams, Stephen P. Ruggles, Andrew Campbell, Moses S. Beach, and G. P. Gordon, as to printing presses; Samuel W. Collins and Elisha K. Root, as to ax making; Oliver Ames, as to shovels; William Woodworth, as to wood working; Thaddeus Fairbanks, as to scales; John J. Howe and Chauncey O. Crosby, as to pin making; Eliphalet Nott and Jordan L. Mott, as to stoves; Robert L. and Alexander Stuart, as to sugar refining; Matthew W. Baldwin and Ross Winans, as to locomotives; Cyrus H. McCormick and William P. Ketchum, as to mowing and reaping; Samuel Colt, Ethan Allen, Christian Sharps, Edmund Maynard, Rollin White, Christopher M. Spencer, Horace Smith, and Daniel P. Wesson, as to fire arms; Alonzo D. Phillips, as to friction matches; Henry A. Wells, as to hat making; Charles Goodyear, Nathaniel Hayward, and Horace H. Day, as to India rubber; John Ericsson, as to naval construction and hot air engines; Elias Howe, Jr., Allen B. Wilson, Isaac Singer, J. E. A Gibbs, William O. Grover, and William E. Baker, as to sewing machines; S. F. B. Morse, Royal E. House, and David E. Hughes, as to telegraphs; Henry B. Tatham, as to lead pipe; Cullen Whipple, as to wood screws; Jonas Chickering and Henry Steinway, Jr., as to pianos; Henry Burden, as to horseshoe machinery; Linus Yale, as to locks; John A. Roebling, as to cables, chains, and bridges; George H. Corliss, as to steam engines; Asa Whitney and Nathan Washburn, as to car wheels; Gail Borden, Jr., as to condensed milk; William and Coleman Sellers, as to shafting and iron working; Henry Disston, as to saws; James J. Mapes, as to fertilizers; John Stephenson, as to horse cars; R. P. Parrott, as to cannon; Richard J. Gatling, as to Gatling guns.

These men and thousands of others like them enjoyed for a little time the ownership of the property they produced by their own brains and their own hands, out of materials belonging to no one else, and that property of vast and peculiar value has been given to the American people forever. Even during the few years that they enjoyed the ownership of the property, which was theirs by the best and highest of all possible titles—that of creation—they realized but a small fraction of the benefits flowing from their improvements. Even during that limited period the lion's share inured to the public benefit in added comfort and lowered prices.

The patent law does not exist for the benefit of inventors. It exists for the benefit of the public. The enlightened public selfishness which called that act into being was expressed in the organic law—in the Constitution of the United States—when Congress was therein authorized to secure 'for limited times to authors and inventors the exclusive right to their respective writings and discoveries,' in order 'to promote the progress of science and useful arts.' The magnificent degree in which the progress of science and the useful arts has been promoted in America by wise patent laws ought to be clear to the dullest comprehension.

The benefits of the patent system are by no means confined to the manufacturing industries. It may well be doubted whether the larger benefits do not flow to that portion of our people who seem to have the least connection with those industries. It was Whitney's improvement in the cotton gin which made possible the marvelous cotton culture of the South, producing thirty-six hundred and twenty-two million pounds of the staple in 1889, which without the schoolmaster's invention would have required the labor of three millions of men for a year simply to clean it.

The settlement and cultivation of the great West have been made possible only by patented improvements in agriculture and in transportation. Under the old order of things it would have required the labor of all the men and boys in the United States, some twenty-four millions in number, to plant and till and harvest the American corn crop of 1889, it being more than two thousand millions of bushels, raised upon seventy-eight million acres of land, leaving to take care of itself meanwhile four hundred and ninety million bushels of wheat and seven hundred and fifty million bushels of oats produced in that