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ANNUAL REPORT OF THE COMMISSIONER OF PATENTS.

The annual report of the Commissioner of Patents to Congress, for 1872, has just been sent in, from which it appears that the affairs of the Patent Office are in good order and flourishing condition. 3,090 caveats were filed last year, being a slight decrease over the previous year. 18,246 applications for patents were made, of which 13,590 were granted. A slight increase in the number of patents granted is shown, and a considerable decrease in the number of applications made, which the Commissioner explains in a curious way. The decrease of applications and increase of the number of patents granted, is due, he says, to the circulation of the office publications, giving to inventors, manufacturers, and attorneys reliable information as to what inventions are already patented, thereby securing better applications but fewer in number.

Now, if this is so, if the effect of the office publications has been thus quickly and noticeably, during the first year, to reduce the number of applications, and yet to increase the number of patents granted, may we not expect similar results, in greater ratio, a few years hence, when the aforesaid publications are more extensively circulated? Let us look at the results for the next five years, allowing that the ratio remains only the same:—Number of applications made in 1871, 19,472; in 1872, 18,246; decrease, 1,226. Number of patents granted in 1871, 13,033; number granted in 1872, 13,590; increase, 557.—Allowing the same ratio each year for the next five years, we should have the following results for the year 1878:—Number of applications made, 12,160, and number of applications granted, 16,375. Evidently it will not do to carry forward the Commissioner's deductions.

A much more probable explanation for the discrepancies in the figures for 1871 and 1872 would be this:

In 1871 the Office was overcrowded with business and delays ensued, and the examiners doubtless rejected many cases for the first time which, on revision in 1872, they decided to allow. The falling off of 1,226 applications in 1872 is probably due to the discouraging effects upon inventors of the official delays during the year preceding.

The Commissioner informs us that the expenses of the Patent Office have been increased during 1872; but we are satisfied that the money has been well spent in providing room, and in reproducing copies of back patents.

The various official publications of diagrams, claims, bound volumes of reduced copies, and full size copies of patents have been admirably produced, and reflect the highest credit upon the Commissioner. This department of publication has become one of the most important branches of labor at the Patent Office, and is of inestimable value to the country. The publication of a general Index to the patents, and a Digest of the inventions, are highly important works which ought to be proceeded with, and we hope that Congress will give to the Commissioner the necessary authority. The Commissioner recommends that a law to authorize the extension of patents granted subsequent to 1861 should be enacted. We trust it may be.

In urging Congress to adopt his scheme for the "reorganization" of the Patent Office, the Commissioner makes the following statement:—"After careful and extended enquiry, I am convinced that considerably more than one half of the capital employed in manufacturing in the United States is thus invested because of the security to specialties obtained from patents." "For this reason," he says, "the demand for better examinations and more care as to the wording of specifications and claims before issuing patents or rejecting applications, is increasing every day. The business of the Office is being done under a plan of organization adopted in

its infancy—a plan adequate to its wants at that time, but which has been outgrown by its enormous increase of business." The italics are ours.

The Commissioner's plan for "reorganization" is simply to place a set of nine bosses over the present examiners, to be called "chiefs of division," who are to supervise the work of the examiners and decide whether their decisions are to stand, and whether a patent shall be granted or refused. We deprecate the addition of any new forms and ceremonies, with their attendant delays, red tapeism and expenses, to the business of obtaining patents. We prefer the *infantile* system as it now exists, which works so well, gives such general satisfaction, and affords such ample securities that, according to the Commissioner's own showing, it now employs *one half of all the capital invested in manufacturing* in the United States.

It is a good old adage: "Let well enough alone." It would be hard to find a system that works better than the present, and we say, *let it alone*. The simpler the forms and the more prompt the official action in the grant of patents, the more will the inventive genius of the country be fostered and encouraged.

A BLOW TO THE TRADES' UNIONS.

The last volume of the Massachusetts Law Reports contains the ruling of Chief Justice Chapman, in a case which involves the question of whether trade organizations have any right to exact fines, or use other means of extortion to compel employers to accede to their demands. The plaintiff, Mr. John Carew, had contracted to supply a certain quantity of hewn stone; certain members of a society called the Journeyman Freestone Cutters' Association of Boston obtained from him the sum, or fine, as they called it, of \$500, by threatening to deprive him of laborers necessary to him for the fulfilment of his contract, and by actually inducing some of his employees to leave. The action was brought to recover. The court ruled that the plaintiff might regain not only \$500 but any damage to his business caused by the acts of the conspirators. Chief Justice Chapman says, in his opinion: "The acts alleged and proved in this case are peculiarly offensive to the principles which prevail in this country; and if such practices could enjoy impunity, they would tend to establish a tyranny of irresponsible persons over labor and mechanical business which would be extremely injurious to both."

There is not an employer or a right minded workman in the country who will not rejoice at the placing upon record of so clear, resolute and unequivocal a condemnation of the whole system of trades' unionism as it is now practiced. One or two such decisions in this State are greatly needed, and would do more to prevent such uprisings as that of last summer than years of discussion between the contending parties. We have plenty of laws on our statute books militating against conspiracy; and, if none of them cover such cases as that above cited, let some of the employers who suffered by the great strike see that the proper steps be taken to have suitable enactments framed by the Legislature, that will effectually remedy all existing evils.

THE VIENNA EXPOSITION.

The buildings of the Vienna Exposition are now completed and in readiness for the reception of the articles to be exhibited. Several changes have, we learn, been made in the general plan. The center space of the Palace of Industry, instead of being divided up, has been converted into one colossal rotunda, the largest roofed building in existence, measuring 426½ feet in diameter and 300 feet in height. The iron work of the roof weighs 40,000 tons, and it may be imagined that it required no small effort of engineering skill to raise this enormous load to a height of nearly 300 feet. The work was accomplished by 240 men in three months. The central structure is iron, covered with an outer coating of masonry connected with the interior by girders. Some idea of the dimensions of the vast fabric may be gained from the fact that a regiment of infantry numbering 1,400 men could conveniently be paraded on the architectural cornice which runs round the inside where the roof joins the columns.

The materials of which the buildings are composed are mainly iron, wood and glass, but the walls, where not clear-storied, are filled in with brick. The outward decorations, which are very imposing and of a solidity apparently sufficient to last for ages, are made of canvas steeped in fluid plaster of Paris and hardened in molds. With admirable taste, a blue texture of jute spangled with golden ornaments has been selected as a wall covering, which contrasts agreeably with the dark red of the supporting columns.

The machinery hall is a simple brick building with no pretension to architectural display. The motive powers, cranes, boilers and engines are all themselves exhibits. All engines under seventy-five horse power and cranes lifting less than twelve tons are excluded. Borsig's engine factory in Berlin, which turned out its two thousandth locomotive for the Paris Exposition, in 1867, will exhibit its three thousandth in Vienna.

The supplementary structures will consist of edifices for the accommodation of distinguished visitors, and annexes to hold the excess of exhibits not finding room in the great galleries. The Austrian Emperor is to have a magnificently fitted up pavilion, and it is stated that the French and German buildings will vie with it in grandeur. Krupp, of cast steel renown, will stock a special edifice with his own inventions, and the *New Free Press* boldly aspires to out-do the London *Times*, whose machinery was last year exhibited in London, by erecting a pavilion of its own. One space of 1,600 square meters is appointed to hold German educational apparatus and appliances.

Danger from fire is put almost beyond the reach of possibility. There is a large basin of water in the grounds, filled conveniently from the adjoining Danube, which might at any moment convert the whole area into a lake. The basin was constructed at a cost of \$12,000, and in addition thereto, fire engines and hydrants are provided in sufficient numbers to inundate every gallery in the buildings.

THE SCIENCE RECORD FOR 1873.

In reply to various enquiries we would state that Science Record for 1873 is now almost through the press and will be issued either next week or the week after, when all to whom copies are due will be immediately supplied. A large edition has been ordered. It is a handsome octavo volume of six hundred pages, illustrated with many engravings. The Engineering department contains views of several of the most important railway bridges in this country, the great Suspension Bridge between New York and Brooklyn, Steam Street Cars, improvements in engines, injectors, mills, and machinery of all descriptions.

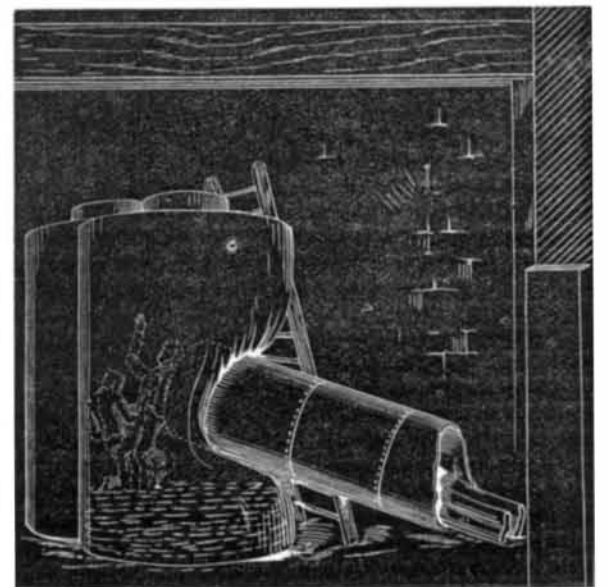
The department of Geography contains illustrations from the Yellowstone region, showing the wonderful pools, hot springs and other extraordinary formations, which are among the wonders of the world.

The department of Biography is rich in portraiture, containing steel and wood engravings of distinguished men of science, including Professor Joseph Henry, Professor Tyndall, Professor Dana, Professor Peirce, Professor Bunsen, Professor Kirchhoff and Professor Morse. The portrait of the latter is engraved from a painting from life taken some years ago, soon after Professor Morse had completed the first line of telegraph, between Baltimore and Washington, when he was in the vigor of his life.

The book is one of interest and value for lovers of progressive, practical science. The advertisement on another page shows the general scope of the contents.

THREE FEARFUL BOILER EXPLOSIONS IN ONE DAY.

Three terrible boiler explosions have recently occurred on the same day, February 3d, one resulting in the death of nineteen persons and the wounding of nearly two score more. One of these explosions took place at Pittsburgh, Pa., another at Syracuse, N. Y., and the third near Norristown, Pa. To an esteemed correspondent, Mr. W. B. Le Van, of Philadelphia, we are indebted for the accompanying diagrams and details of the casualty at the rolling mill of Messrs. J. Wood & Bro. at Conshohocken, near Norristown, Pa., which destroyed about one half of the establishment. The exploded boiler was 18 feet long and 4½ feet in diameter, and had been in constant use in the mill for twenty years. It had two flues, each 18 inches in diameter, which, with the shell, were originally of No. 4 iron, calculated to withstand 80 pounds working pressure to the square inch. At the ruptured point, the iron had become but three sixteenths of an inch in thickness, and was besides much crystallized. When the explosion took place a portion of the boiler was hurled, end first, across a canal and a railway track into a building known as the Albion Print Works. There it encountered a girder of an arched doorway, shattered it (with the adjacent wall) and finally lodged in a large iron kier, used for steam-



ing pieces of muslin, in the manner shown in our diagram. Two boys were engaged within the kier, distributing the warp for bleaching, both of whom were instantly killed. The kier was 8 feet wide and 12 feet high.

Ten minutes before the accident the steam gage showed a pressure of 53 pounds. The close flattening together of the flues indicates that they collapsed from force externally applied. There is little doubt as to the cause of the disaster. The boiler was simply used up, and the thinness of the iron and the clean, smooth rupture show that it had become inadequate to withstand the required pressure. Eleven persons were killed outright and a similar number, more or less, badly wounded. The responsibility of this awful disaster appears to rest upon the proprietors, and forms another link in the long chain of similar horrors due to a negligence of reasonable precautions for the safety of human life.

The Pittsburgh explosion occurred in the extensive American Iron Works of Messrs. Jones & Laughlins. These works are among the largest in the country, covering fifteen acres of ground and employing three thousand workmen. It is here that the celebrated cold rolled shafting is made. The explosion involved a battery of four boilers located in the central part of the numerous workshops. The spike and nail