

Scientific American.

MUNN & CO., Editors and Proprietors.

PUBLISHED WEEKLY AT
NO. 37 PARK ROW, NEW YORK.

O. D. MUNN.

A. E. BEACH.

TERMS.

One copy, one year.....	\$3 00
One copy, six months.....	1 50
CLUB RATES { Ten copies, one year, each \$2 50.....	25 00
{ Over ten copies, same rate, each.....	2 50

VOL. XXIX., No. 11. [NEW SERIES.] Twenty eighth Year.

NEW YORK, SATURDAY, SEPTEMBER 13, 1873.

Contents.

(Illustrated articles are marked with an asterisk.)

Accident to the new docks.....	161	Mordants for aniline colors.....	164
American Association for the Advancement of Science, the.....	168	Nerve force, the origin of.....	164
Answers to correspondents.....	171	Notes and queries.....	171
Balloon and the aeronauts, the.....	159	Ozone generator, new.....	167
Balloon valves.....	164	Patent congress, end of the Vienna.....	160
Balloon voyage to Europe, the.....	160	Patents, official list of.....	172
Business and personal.....	171	Patents, recent American and foreign.....	170
Cinder fuel.....	162	Patents, recent American and foreign.....	170
Compressed air, coal mining by.....	168	Patents, recent American and foreign.....	170
Cumberland Gap Cave.....	169	Printing press, Hoe's new.....	160
Derrick, the large floating.....	162	Printing press, Hoe's new.....	160
Hayfever.....	161	Property in inventions.....	164
Highest land east of the Mississippi.....	161	Railroad fire engine, a.....	167
Hot air, the.....	169	Railway couplings, reward for improved.....	162
Hot atmospheres, working in.....	162	Ronalds, Sir Francis, F. R. S.....	162
Hydraulic propeller, a new.....	166	Sand club, the.....	166
Inventions patented in England.....	170	Scientific and practical information.....	161
by Americans.....	170	Scientific and practical information.....	161
Largest engine in the world, the.....	169	Soundings, deep sea.....	164
Lifboat service, the national.....	169	Sun spots, theories of the.....	160
Loom, Short's patent.....	167	Turbine water wheel.....	166
Magic lantern as a means of demonstration, the.....	163	Vienna exposition, the—Letter from Professor Thurston.....	165
Medal for Cleveland, a grand.....	169	Waste of fuel in stoves, enormous.....	169
Mental atmosphere, the.....	167	Water new, exudation from the.....	162
Metempsychosis.....	169	Whips, improved.....	165
Miracles, modern.....	160		

END OF THE VIENNA PATENT CONGRESS.

The labors of this body were brought to a close on the 5th ult., after debate on the resolution mentioned in our last issue. The recommendations given below were adopted by a vote of 74 to 6. It will be noticed that the resolutions cover little more than is contained in the existing patent laws of the European States. The conservative, narrow-minded policy appears to have predominated among the members, who were evidently unable to appreciate the wants of inventors, or give expression to liberal and progressive sentiments concerning the value of inventive labors. Some of the reasons given in support of the adopted resolutions are peculiar, if not erroneous. The last and best thing done by the Congress was to appoint a committee to choose members and convoke a second Congress. Let us hope that the new body will be more competent to deal with the subject. The following are the resolutions in full.

“RESOLUTION I.—The protection of inventions is to be guaranteed by the laws of all civilized nations under the condition of a complete publication of the same, because:

- a. The sense of right of civilized nations demands the legal protection of intellectual work.
- b. This protection affords the only practical and effective means of introducing new technical ideas, without loss of time and in a reliable manner, to the general knowledge of the public.
- c. The protection of invention renders the labor of the inventor remunerative, and induces thereby competent men to devote time and means to the introduction and practical application of new and useful technical methods and improvements, or to attract capital from abroad, which, in the absence of patent protection, will find means of secure investment elsewhere.
- d. By the obligatory complete publication of the patented invention, the great sacrifices in time and money, which the technical application would otherwise impose upon the industry of all countries, will be considerably lessened.
- e. By the protection of invention, the secrecy of manufacture, which is one of the greatest enemies of industrial progress, will lose its chief support.
- f. Great injury will be inflicted upon the countries which have no rational patent laws by the native inventive talent emigrating to more congenial countries, where their labor is legally protected.
- g. Experience shows that the holder of a patent will himself make the most effectual exertions for a speedy introduction of his invention.

RESOLUTION II.—An effective and useful patent must have the following principles:

- a. The inventor or his legal heir only can obtain a patent. A patent cannot be refused to a foreigner.
- b. In order to carry out the principle stated above (a), the introduction of the system of a preliminary examination is recommended.
- c. A patent for an invention should be granted for fifteen years, or the option should be to extend it to that period.
- d. The granting of a patent must be accompanied by a detailed and complete publication, which renders the practical application of the invention possible.
- e. The cost for the granting of a patent should be moderate; but in the interest of the inventor, an increasing scale of fees should be fixed, so as to cancel a useless patent as soon as possible.
- f. It should be easy to obtain, through a well organized patent office, the specifications of any patent, as well as to ascertain which patents are still in force.
- g. Laws should be passed by means of which a patentee may be compelled, in cases of public interest, to allow the use of his invention for a suitable remuneration to all bona fide applicants.

For the rest, and especially with respect to the proceedings in the granting of patents, the Congress refers to the English, American, and Belgian patent laws, and to the proposition made by the union of German engineers for a patent law of the German empire.

RESOLUTION III.—In consideration of the great difference between the existing patent laws, and in consideration of the altered state of international communication, the necessity of reform becomes evident, and it is to be strongly recommended that the different governments should endeavor to arrange, as soon as possible, an international understanding on the patent laws.

The not executing of a patent in a country is no reason for its becoming void in that country, as long as the invention has been carried out once, and the possibility is there that the right of using the invention can be obtained by any inhabitant of this country.”

Resolution I (f).—This, we suppose, is a hit at Holland and Switzerland, where there are no patent laws. The Hollanders will laugh at the idea of injury to their country by the departure of their inventors. There are almost none to depart. The object of a patent law is not to prevent emigration, but to bring forth an abundant supply of new and original improvements, the working of which shall promote industry and happiness among the people, thereby increasing the national wealth and strength.

Resolution II (b).—The best patent law is that which

supplies the inhabitants of a country with the greatest number of new and useful discoveries. The less the costs to which the inventor is subjected in maintaining a patent, and the more simple the process of obtaining it, the more will he be encouraged to invent.

The system of preliminary examination here proposed is intended to be something like that now in vogue at our Patent Office at Washington, which is believed by many to be productive of more mischief than benefit. It consists in the maintenance, at the expense of the inventor, of an army of paid officials, whose prime duty it is to find objections to the grant of petitions to patents, and it compels applicants to support another corps of lawyers and agents to combat the points raised by the examiners.

The inventor himself is the best examiner. All the government needs to do is to supply him with copies of previously granted patents at a cheap rate. He can then decide for himself, without official assistance, whether or not he ought to apply for a patent.

(e)—The increasing scale of patent fees here recommended exists in nearly all European countries, and, instead of being advantageous to the inventor, works practically to his disadvantage. Take England, for example. The second patent fee is \$250, the third, \$500. We have in mind now the actual case of an inventor of a valuable improvement. He is a poor man. With great difficulty he was enabled to meet the second fee of \$250 which made his patent valid for three and a half years longer. That term is now about to expire, and he is called upon for \$500 more which he will be unable to pay; and for want of the money, will lose his patent just as he was in prospect of making an advantageous arrangement for introducing the invention in England.

The interest of the inventor demands that only one fee, and that a very small one, should be charged for a patent. The practical effect of this increasing scale of fees is to subject meritorious inventors to serious pecuniary losses.

(g)—Why should laws be passed to fix the prices of commodities that inventors sell any more than the goods sold by ordinary merchants or traders? The Congress fails to give us any reason for its recommendation of this outlandish proposition. Its practical effect would be the appointment of a board of officials, to be paid and supported by the inventor, charged with the duty of depriving him of all voice in the sale of his own inventions.

Resolution III.—In Austria and some other countries the inventor is required to put and maintain his invention in use within a specified period—a year, or two years—after the grant of the patent. Failing so to do, the patent becomes null. By this resolution a change is recommended, to the effect that it shall suffice if the inventor only once begins the manufacture, he not being required to continue the work.

This is the most novel and liberal suggestion contained in any of the resolutions.

HOE'S NEW PRINTING PRESS.

A new style of steam printing press, of the fast kind, specially intended for daily newspapers, has just been perfected and put in operation in London, by Messrs. Hoe & Co., the well known press makers of New York city. The new press is designed for the use of the London Daily Telegraph, a two cent paper, said to have the largest circulation of any daily newspaper in the world.

The improved machine, on a recent trial at Lloyd's paper mill, Bow, actually printed and delivered, in even piles, twenty-two thousand copies of Lloyd's Weekly, a large sheet—in sixty minutes, with the attendance of two men and a boy. The sheets are delivered printed on both sides, and the number of newspaper impressions when the sheet is cut apart by the machine is forty-four thousand per hour. The machine is built on the rotary plan like the Bullock, Walter, and other presses, and is said to yield superior printing.

The cost of each press is \$17,500. The Telegraph is to be supplied with ten of them, and thus have the means of printing 220,000 copies of the paper in sixty minutes.

THE BALLOON VOYAGE TO EUROPE.

It is now definitely announced that the Graphic balloon will start on its transatlantic voyage between September 1 and 10. We understand from Mr. Donaldson, one of the aeronauts, that the last mentioned day will in all probability be the day of departure. The principal part of the labor of construction of the great air ship is done, and nothing remains but the completion of a few details and the joining of three or four seams. The rainy weather during the past few weeks has retarded the work and prevented the rapid drying of the varnish, thus causing inevitable delay.

The entire apparatus, when finished, will be transported to the Capitoline grounds in Brooklyn, N. Y., and there a preliminary inflation with air will take place in order to test the gas-holding power of the fabric. The balloon will then be emptied, and, if the prognostications of the Weather Bureau prove favorable, will be inflated to its full capacity of 450,000 cubic feet of illuminating gas. The ascent will be made at about six o'clock in the evening, that time being chosen from the fact that the gas will be rapidly condensing, and hence a greater sustaining power can be gained than if the balloon were filled during the heat of the day, when its contents would be subject to increased expansion.

We notice that a petition, signed by several prominent members of the community, requesting that the public be admitted to witness the ascent of the balloon, has been sent to the managers of the Graphic company. In perusing this document, we are somewhat at a loss to determine which amuses the most, the veridancy of its signers in gravely beseeching the Graphic people to perform precisely what the latter could not possibly be induced to forego doing, or the

delightful coquetry with which our enterprising contemporary dallies with the request through some three sticksful of double leaded editorial, after the fashion of “whispering she would ne'er consent, consented.” Really, for any one to suppose that the originators of this very laudable scheme have, or ever had, the remotest intention of letting that balloon go without parading the circumstance with just as sonorous a flourish of trumpets and before as big a multitude as can possibly be assembled, indicates an ignorance of modern journalistic enterprise which is refreshing in its utter simplicity.

In a succeeding number, we shall publish some interesting details regarding the construction of the balloon, together with illustrations of ingenious and novel devices to be used during the voyage.

MODERN MIRACLES.

However much believers in the progress of reason and consequent decline of superstition may argue that the age of miracles has passed, and that such supernatural phenomena would be speedily stripped of their mystery by the scientific rationalism of the day, it is nevertheless an undeniable fact that a tangible confutation of their views now exists, and that a so-called miracle has taken a firm hold, not merely upon the masses, but has carried conviction to many learned and distinguished savants and men of eminence in a nation, one of the foremost in the ranks of modern civilization.

Since the Franco-Prussian war, a religious revival of unprecedented fervor has taken place in France, and a series of remarkable pilgrimages are now being made to the locality where the above referred-to miracle took place. This celestial manifestation is based on so frail a foundation that it adds further proof to the well known saying that a people desirous of believing will always find foundation on which to ground their belief. The story goes that Bernadette Soubirons, a weak and sickly peasant child residing with her parents at Lourdes, France, while gathering wood with her companions, reached a grotto, near the town, in which was a shrine to the Virgin. Kneeling to repeat her prayers, the girl felt an “invisible” wind, saw a glorious radiance, and beheld a woman, who, her instinct told her, was the Virgin, standing on the rock. Returning home she told her vision and described the garments of her celestial visitor, even to a string of white beads on her head. On again repairing to the grotto, Bernadette received other visitations; finally the story spread, a sign was asked for, and a spring of water, to which wonderful healing powers are ascribed, gushed from the rock.

If there be any miracle in the circumstance, it seems to us to lie in the fact that people, not by tens and twenties but by hundreds of thousands, constantly attest their belief in it; and stranger still that scientific journals as able as Les Mondes should devote pages to defending its authenticity. A sick child laboring under a disordered constitution, and a spring opportunely trickling from the stone, sum up the entire wonder.

The peculiarity of this especial mystery is that it is not susceptible of direct test, and is, therefore, a mere matter of faith. There has apparently been no attempt at deception on the part of its originator, and hence the credence placed in it is a matter of mere volition on the part of believers.

If the editor of Les Mondes will visit any negro camp meeting in the United States, he will remark innumerable repetitions of fits of religious ecstasy, such as that of Bernadette. He will find both young and old of both sexes shouting, singing, and launching off into descriptions of golden cities and celestial inhabitants, which they sincerely believe they see, which will throw the peasant girl story far into the shade.

THEORIES OF THE SUN SPOTS.

The question of the solar constitution, and more especially that of the nature and cause of sun spots, has ever since the first discovery of the latter phenomena, by Galileo, Fabricius and Scheiner, been a constant subject of difference between students of astronomical physics. Totally opposite theories have been enunciated, and have found able and learned supporters, only, however, to be abandoned for new views formed by the light of more recent investigation; and thus up to the present time, no solution of the problem, to the entire satisfaction of the scientific world, has as yet been adduced.

In here referring to the subject we allude briefly to the principal ideas held by some eminent astronomers and physicists, but more especially we lay before the reader the two theories which are now attracting considerable attention through the extended public discussion by their learned originators. Early observers (Galileo and afterwards Hevelius) attributed the spots to dark scoriae floating on solar seas. In 1769, Dr. Wilson determined them to be cavities or depressions below the sun's surface, a view confirmed by the researches of Sir William Herschel. The latter astronomer's theory suggested the enclosure of the sun by two strata of clouds, the outer one self-luminous and the other opaque, though partially illuminated by the outer layer. When an opening was formed through both strata, the dark body of the sun appeared surrounded by a penumbra, due to the less luminous under layer. Kirchoff advanced the idea that the spots were clouds, floating in the sun's atmosphere and obscuring portions of the glowing surface. Subsequently a protracted controversy arose between the French and English astronomers, the former maintaining that the absence of light was due to a defective radiation of a gas in the sun, the latter to absorption. De la Rue, Stewart and Loewy held the last mentioned view; and in 1866, their