Scientific American.

ESTABLISHED 1845.

MUNN & CO., Editors and Proprietors. PUBLISHED WEEKLY AT

No. 361 BROADWAY, NEW YORK.

O. D. MUNN.

210

TERMS FOR THE SCIENTIFIC AMERICAN.

The Scientific American Supplement

-=:: ::

A. E. BEACH.

THE SCIENTIFIC AMERICAN Supplement is a distinct paper from the SCIENTIFIC AMERICAN. THE SUPPLEMENT is issued weekly. Every number contains 16 octavo pages, uniform in size with SCIENTIFIC AMERICAN. Terms of subscription for SUPPLEMENT, 55.00 a year, for the U. S., Canada or Mexico. 66.00 a year to foreign countries belonging to the Postal Union. Single copies, 10 cents. Sold hy all newsdealers throughout the country. See prospectus, last page. Combined Rates.—The SCIENTIFIC AMERICAN and SUPPLEMENT will be sent for one year, to one address in U. S., Canada or Mexico, on receipt of seven dollars. To foreign countries within Postal Union, *ight* dollars and fifty cents a year.

Building Edition.

Building Edition. The Auchitzers AND BUILDERS EDITION OF THE SCIENTIFIC AMERI-CAN is a large and splendid illustrated periodical, issued monthly, con-taining floor plans, perspective views, and sheets of constructive details, pertaining to modern architecture. Each number is illustrated with beautiful plates, showing desirable dwellings, public buildings and archi-tectural work in great variety. To builders and all who contemplatebuild-ing this work is invaluable. Has the largest circulation of any architec-tural publication in the world. Single copies 25 cents. By mail, to any part of the United States, Canada or Mexico, 82.06 a year. To foreign Postal Union countries, 81.00 a year. Combined rate for BUILDING EDITION, SCIENTIFIC AMERICAN and SUP-PLEMENT, 89.00 a year. To foreign Postal Union countries, \$11.00 a year. Singnie conduction and Sup-Super State of the State of Super Super States (States) a year. Combined rate for BUILDING EDITION, SCIENTIFIC AMERICAN and SUP-PLEMENT, \$9.00 a year. To foreign Postal Union countries, \$11.00 a year.

Spanish Edition of the Scientific American. SPANISH Edition of the Scientific American. LA AMERICA CIENTIFICA E INDUSTRIAL (Spanish trade edition of the SCIENTIFIC AMERICAN) is published monthly, uniform in size and typo-graphy with the SCIENTIFIC AMERICAN. Every number of La America is profusely illustrated. It is the finest scientific, industrial trade paper printed in the Spanish language. It circulates throughout Cuba, the West Indies, Mexico Central and South America, Spain and Spanish posses-sions-wherever the Spanish language is spoken. \$300 a year, post paid to any part of the world. Single copies 25 cents. See prospectus. MUNN & CO., Publishers, 301 Broadway, New York.

The safest way to remit is by postal order, aspress money order, draft or bank check. Make all remitiances payable to order of MUNN & CO. Readers are specially required to prove the same special spe & CO.
F Readers are specially requested to notify the publishers in case of any failure delay, or irregularity in receipt of papers.



TABLE OF CONTENTS OF SCIENTIFIC AMERICAN SUPPLEMENT No. 953.

For the Week Ending April 7, 1894.

Price 10 cents. For sale by all newsdealers.

PAGE

I. ASTRONOMY.-The Planet Venus.-A popular and inter sting ar-ticle on the different a pects of the planet -4 illustrations...... 15236

- 11. BACTERIOLOGY.—Action of Light on Bacteria.—By Prof. H. M. WARD.—Results obtained by exposing bacterial cultures through
- 15234 1522
- IV. ELECTRICITY. -Electrically-propelled Vehicles for Ordinary Roads.-Electrical vehicles now being exhibited in London.-1 illustratio 15230
- V. ENTOMOLOGY.-The Acari.-A minute parasite and its cu-
- VI. MECHANICAL ENGINEERING.—The Automatic Balance of Reciprocating Machinery and the Prevention of Vibration.—By W. WORBY BEAUMONT.—A valuable paper on the subject of in-creasing importance in the use of high speed machinery.—14 illus-trations. 1522 Tubo Roilor

PATENTS FOR THE YEAR 1893.

every way is a noteworthy document.

of great conceptions and that the World's Columbian |100,000 cards will be thrown open to the public. Exposition will make itself felt in stimulating invention. Of recent criticisms passed upon the patent our appreciation of the ability shown in the report. system, those complaining of the inconsiderate grant In some ways it is an innovation, the present Comof invalid patents are treated as most germane to the missioner holding very definite views of his own upon question of administration of the office. The Commis- the subject of the administration of the office, and sioner upholds throughout the report the expediency of expressing them very clearly. Much of his work is the office granting only valid patents. A classification worthy of high commendation, although we cannot division for systematizing the records of the history of agree with him in all his views. The report, curiously invention, making as far as possible the scientific and enough, illustrates the great difficulty and virtual patent literature of the world accessible, is proposed. impossibility of the Patent Office making an adequate A salaried force of fifty-two employes is needed for examination into the novelty of an invention-an exthis, some, however, giving but a part of their time to amination which the Commissioner wishes to have a the classification work. The idea is to make the office sine qua non, in the fullest degree of adequacy, for search for novelty more thorough, and to give the the issuance of a patent. office a higher standing upon the question of invention.

A study of eighty-one court patent cases, in which the patents were declared invalid, was made, and disclosed the fact that in twenty-six the references is an old proverb, but one which men have been slow which defeated the patents were not shown to have to apply. been cited by the office, in twenty-nine a part were so cited, leaving twenty-six which were decided asylums for the insane, instead of enforcing truant on office references. Again, in 988 court cases (1886 | laws, preventing the opening of dens of iniquity, and -1892), 436 patents were sustained, and 532 were declared invalid in whole or in part. Of the latter, 428 were declared so by reason of some fault of the keeps the tenants from stifling. office, and 124 on new evidence. The results of a law firm's examination of fifty claims in ten patents held have begun. The laws which science has discovered that thirty-five were invalid. The Commissioner cites the above and he feels that they and their like indicate the necessity for a more thorough search by the office. By classification and indexing the library and records is no longer necessary that typhoid or scarlet fever, in general the Commissioner hopes to effect an improvement in the search operations.

Recently three primary examiners resigned. The cases they had passed to issue were re-examined, and the best constructed houses have a room intended for in one hundred and fifty cases the applications were t temporary hospital use, with appliances which make withdrawn from issue, upon the ground that patents its almost complete isolation possible. The mother is if granted for them would be void. This fact also is no longer considere unfeeling if she does not nurse cited in the report to emphasize the importance of the classification of records and publications.

Various other points are spoken of. The office hereafter will make photographs of the drawings of patents in those cases where changes in the drawings are required or permitted, and will make the photographs part of the files of such cases. This is an excellent who knows symptoms and how to act upon a change rule, as giving a full record of the original application. Precedence is to be given from the outset to actions upon the merits of applications; requirements in matters of form are to come after the other has been acted on, and after patentable matter has been found. Division of applications is only to be insisted on when an and its work is largely preventive. attempt is made to put several distinct inventions in one patent.

drawings of patents which expire just before the date of the Gazette. This innovation, the Commissioner believes, will be a benefit to the public, partly as giving to the well, incidentally giving lessons in cooking and present subscribers, in a sense, the benefits of the Gazette of seventeen years ago.

The Patent Office exhibit at the World's Fair is alluded to. It has, as far as possible, been kept intact, and is now on exhibition in the Patent Office.

Legislation is recommended in several directions. The price of copies of patents, the Commissioner believes, could in many cases be advantageously lowered. The limitation of the term of American patents to the period fixed by the expiration of foreign patents for the same invention, the Commissioner $\frac{1}{1} \frac{1}{1} \frac{1}$ would have changed, so that an American patent for months of the date of application in any foreign remedy in childhood while the muscles and ligaments country. Legislation in the direction of establishing a patent bar is also recommended.

> otal net receipts of \$1,242,871.64, against an expenditure of \$845,403.36 under the appropriation, with approximately \$295,635.09 additional, giving a balance in Massachusetts School of Technology is one of the the office's favor of \$101,833.19. There were 38,473 applications for patents, including 1,000 applications for designs and 120 for reissue. Twenty-three thousand supplies of the State, the best methods of the filtration six hundred and seventy patents were issued and 99 reissued. The patents issued and reissues granted during the year were less than those in 1885, 1889, 1890 respectively. Up to January 1, 1894, 521,700 patents have been granted by the United States, against 817,362 by all other countries. The year 1890 with 26,292 patents and reissues granted remains the banner matters. year of the office. An exhaustive report upon the scientific library of Institute, by Professor Atkinson and others, and the the Patent Office is included as an appendix to the consequent opening of "New England Kitchens," Commissioner's report. This gives the history and where nutritious food at a low price may be had by present condition of the library, its scope and the condition of its indexing. An earnest plea is made for intemperance and its numberless attendant miseries. more money, and the need of further expenditure for

> THE ANNUAL REPORT OF THE COMMISSIONER OF its maintenance seems very clearly shown. During the year over thirty-one thousand journals and articles The Annual Report for the year 1893 of the United have been indexed. An appropriation of but \$2,500 States Commissioner of Patents has been published. was allowed for purchase of books and periodicals and It appears in the official Gazette of March 27, and in for transportation. The present effort is to make an adequate card catalogue with cross references. Within a The ground is taken that the race retains the power few months it is hoped that the catalogue of about

> > We cannot let the occasion pass without expressing

---PREVENTION BETTER THAN CURE.

"An ounce of prevention is worth a pound of cure"

The State enlarges its prisons and reformatories and forbidding the housing of human beings where disease festers and spreads with the very breeze which

But there are many signs that changes for the better are making their appeal to the reason of more people than in any previous time and preventive measures are used where a few years ago they were unknown. It or even the lesser children's diseases, go through a well-conditioned family. The patient is now quarantined in the most remote room of the house; indeed, her sick child, or the daughter unfilial if she commits the care of an invalid parent to a trained attendant. People with common sense now perceive that to sacrifice nervous energy is not the best way to show affection, and that the member of the family who is ill can be helped back to health much faster by some one for the worse before the doctor arrives than by one whose only fitness for the post of nurse is relationship to the patient.

Probably not a philanthropic organization of today is doing better work than the Red Cross Society,

It gives courses of lectures on "First Aid to the Injured" to policemen, firemen and others. It pays The Gazette now publishes the claims and principal the salary of nurses who are sent among the poorest people in our cities. While they care for the sick in these miserable tenement houses, they act as teachers the laws of health, including cleanliness, which will do more to prevent a recurrence of disease than any other means yet devised.

Now that medical science has made so great advance in the study and treatment of the eye, we may reasonably hope that the day is not far off when it will be considered just as necessary to have the little child's eyes examined to see whether they have congenital defects as it is to have him vaccinated. As a matter of fact, the chances of his ever taking smallpox are small in comparison with the chances that he has been born with astigmatism, shortsightedness of the eyes are in their most elastic condition, but which, neglected, may cause most serious disorders. The business of the office for the year 1893 shows Experiments go far to prove that epilepsy and insanity raceable to imperfect eyes.

Water Tube Boilers. One of the recent developments in steam engineering discussed. —First installment of an exhaustive article on the subject.—10 illustrations	15224	t
VII. METALLURGY.—Blower for Smelting on a Large Scale.—A rotary blower of the turbine type and great capacity The Manufacture and Industrial Value of Aluminum Alloys.— By J. H. J. DAGGER.—A very valuable and exhaustive article on cluminum alloys, with very full tables	15228	$ \mathbf{p} \\ \mathbf{t} \\ \mathbf{p} \\ \mathbf{p} $
VIII. MISCELLANEOUS.—Apparatus for Preventing Accidents in Factories.—Apparatus for instantly stopping the motion of ma- chinery in cases of emergency in factories.—Zilustrations Riders of Many Lands.—English notes on Col. Dodge's celebrat- ed papers		d si is
IX. NATURAL HISTORY.—The Megaladapus.—A most interesting description of one of the typical animals of the island of Mada- gascar, with full illustrations.—3illustrations.		ir sj
X. PHOTOGRAPHYThiocarbamidThe use of thiocarbamid for clearing and removing stains from negatives, with formula	15234	h 8
XI. PHYSICSFlow of SolidsNotes on Tresca's experiments	15228	2
XII. RAILROAD ENGINEERINGEarly English Locomotives Interesting illustrations of early English engines?illustrations.	15223	y
XIII. SANITARY ENGINEERING	15231	1
XIV. SURGERYLocating Metallic Bodies in the Upper Air Pas- sagesBy B. N. HEARD. M.DApplication of the telephone to surgical diagnoses1 illustration	15231	tl C
X V. TECHNOLOGY.—Ancient Egyptian Pigments.—Pigments as used by the early Egyptians	15229	p d
X VI. TOXICOLOGYFish PoisonsBy J. B. NAGELVOORTA note on poisonous plants and their uses	15230	n

The study of sanitary science as carried on at the noteworthy advance movements of the day.

The ventilation of rooms, the purity of the water of water, the condition of milk, the determination of the best kinds and qualities of food for the maintenance of health, are all made subjects of investigation; the principles discovered are applied in the institution and elsewhere as people learn what service students who have had this training can give in these most vital

The study made of foods by Mrs Richards, of the the poor, cannot fail to help in lessening the tide of The work of the Woman's Christian Temperance