Scientific American.

ESTABLISHED 1845

MUNN & CO. - - - EDITORS AND PROPRIETORS.

PUBLISHED WEEKLY AT

No. 361 BROADWAY, - - NEW YORK.

TERMS FOR THE SCIENTIFIC AMERICAN. (Established 1845.)

One copy, one year, for the U.S., Canada or Mexico. One copy, six months, for the U.S., Canada or Mexico... One copy, one year, to any foreign country, postage prepaid. £0 168.5d. 4.00 Remit by postal or express money order, or by bank draft or check.

MUNN & CO., 361 Broadway, corner Franklin Street, New York.

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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, \$5.00 a year for the U.S., Canada or Mexico. \$6.00 a year, or £1 is. Sd., to foreign countries belonging to the Postal Union. Single copies 10 cents. Sold by 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 sven dollars. To foreign countries, eight dollars and lifty cents a year, or £1 14s. 11d., postage prepaid.

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NEW YORK, SATURDAY, APRIL 2, 1898.

(Illustrated articles are marked with an asterisk.)

Alaska, government literature

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A SPANISH VIEW OF THE AMERICAN NAVY.

It is a matter of frequent remark that the average European is as densely ignorant on all questions relating to the United States as the average citizen of this country is well informed on European affairs. It is probable that outside of a comparatively narrow circle in England, France and Germany, the people of the ing." old world have only the vaguest idea of the resources, wealth and social and industrial development of the United States. They see the nondescript crowds that migrate yearly across the western ocean, and they grow accustomed to the thought that America is a huge agglomeration of unassimilated nationalities. They little understand that such is the size and virility of the American race that these myriads are absorbed without disturbing the national equilibrium or changing a line or shadow of the national countenance.

Perhaps it is safe to say that in no European country is there so much misapprehension regarding the United States as in the very one which has good reason just of which were driven by a pair of inside cylinders and now to be best informed regarding us. The information which the Spanish press is giving out to the people is such palpable misinformation that one can scarcely attribute it to mere ignorance, and we are led to believe that the misrepresentation must be willful. One of the most striking instances of this is an article on the United States navy, which appears in a recent issue of the Spanish weekly, La Ilustracion, the "Harper's Weekly" of Spain. The United States has usually been credited in Europe with possessing a navy which, though small in numbers, is of the very latest pattern and includes some of the most original and effective types of ships in the world. The Spanish journal in question, however, lends itself to the task of persuading the Spanish public that our navy is made up of poor imitations of European ships, that it is "manned by hirelings who calculate, while they are connected to the leading pair of driving wheels; a are fighting, what their valor, in cents, should be pair of $14\frac{1}{2} \times 26$ inch inside cylinders connect to two worth to them;" that it is a "navy without traditions of any kind" (ye shades of Farragut, Perry and Paul outside cylinders connect to crank pins set at 180 de-Jones!) and that therefore "it will be nothing remark able if in a short time we see all these" ill designed and worse constructed "vessels go to the rubbish heap."

The article opens by stating that ten years ago our gine. naval efforts were confined to repairing the "Miantonomoh" and her class, which are built "partly of wood" (sic). We are informed that a navy yard has recently been started at Port Orchard, in Brambridge (sic), and that among other places where the navy keeps stores of ammunition and coal is New Oskaut (New Orleans?) on the Atlantic coast. The map of Washington fails to show the name Brambridge, the nearest approach to it being the name of Bainbridge Island, which lies about five miles distant from Port Orchard.

After our contemporary has displayed such an intimate knowledge of our geography, we are not surprised to learn that "important works for the manufacture of armor . . . have been established in Massachusetts under the direction of Mr. Bethlehem." We are informed that these "works can compete with Krupp in Germany;" but lest our confidence and Spanish dismay at this information should be too pronounced, we are informed in the next paragraph that in creating our navy "the tests of armor and other work were unsatisfactory."

This "period of feverish activity was succeeded by Scientific American Supplement three years of calm," after which there came "the war with Cuba . . and the fear of a rupture with Spain," impelled by which we "proceeded secretly (sic) to construct armored vessels," until at length we had at our disposal "what seemed to be a respectable squadron." "Fortunately for us," our contemporary proceeds, "the great funnels and quantity of smoke of the Yankees need not frighten us," and in proof of this a list of the shortcomings of the ships is added, from which we select the following:

> merge the armor plate" (presumably the belt) "entirely, that a bill pending in both the Senate and House of and can only carry a full complement of coal in time Representatives for the allotment of a very modest ad-'Kentucky' present some advantages; . . . but their be lost sight of. In no other department of the governaxes are so badly arranged that the guns which they ment is it expected that the service shall be crippled or carry would be out of combat as soon as they began to the expenses of properly conducting the business be operate." "The 'Texas' has very deficient armor;" limited by the additions we are now making to the . . . "it cannot carry the torpedoes intended for it," army and navy for coast defense and possible foreign and the critic does not spare even the ill-fated "Maine," contingencies, and it would seem ridiculous, if the subbut informs us that "its best speed was 16 miles" (it ject were not really so serious to all inventors, to bring was 17½ knots), and that at this speed "it shipped up any such idea of false economy in opposition to the water at the bow."

> The "Katahdin" "cannot go into battle on the and "Terror" "are provided with a central compart- R. 7082, provides for the employment of an additional ment, easily separated from the body of the monitor; Patent Office force involving an expenditure of \$62,880 a fense." Even the famous run of the "Columbia" drawn and the caution exercised that there shall be no across the Atlantic, at a speed of 18 knots, is dis-room for extravagance on the part of the Patent Office, credited on the ground that the last day's run "could it is especially stated that the whole number of addi-

no longer be made under forced draught." As a matter of fact, the whole run was made under natural draught.

This remarkably lucid and accurate account of our warships concludes by assuring the Spanish public that "the rest of the vessels are not worth mention-

FOUR-CYLINDER LOCOMOTIVES.

The four-cylinder type of locomotive appears to be enjoying quite a run of popularity just now on the other side of the water. At least three of the leading English roads have built engines of this kind, and they appear to be giving satisfaction. The type is not unfamiliar in this country. The Strong locomotive reckoned the four-cylinder arrangement among its many striking novelties, and visitors to the World's Fair at Chicago will remember the James Toleman, an English engine with four driving wheels, the forward pair the rear pair by two outside cylinders.

The object aimed at in the Strong engine was to reduce the amount of counterbalance weight in the driving wheels, and the James Toleman was designed with the view of producing an exceptionally powerful engine without increasing the size of the cylinders and one that would provide sufficient adhesion without the use of side rods. The Strong engine fulfilled all its promises and has shown exceptionally good results on the Perdue testing plant. The James Toleman, however, owing to faulty design, was a failure, the boiler proving to be quite unable to supply the four cylinders with steam.

Of the three new English engines above referred to, the first is a four-cylinder simple engine built for the Glasgow and South-Western Railway. All cylinders cranks set at 90 degrees, and a pair of $12\frac{1}{2} \times 24$ inch grees to the adjoining cranks. This disposition of the cranks and pins enables one set of valve gear to be used for each pair of cylinders on each side of the en-

Mr. Webb has built two experimental four-cylinder engines for the London and North-Western Railway. one of them being a simple and the other a compound. In the simple engine the four cylinders are all of one size, viz., 15 inches diameter by 24 inches stroke, while the compound has two 15-inch outside and two 191/2inch inside cylinders, the common stroke being 24 inches.

'The London and South-Western Railway is experimenting with an engine which has two outside cylinders driving the rear pair of drivers, while another pair between the frames is coupled to the front drivers. This, it will be seen, is a similar arrangement to that on the James Toleman.

It is possible that the English designers are being driven to the use of four cylinders in their endeavor to increase the power of their locomotives. The height of the bridges and the width of tunnels in that country is considerably less than here. The track clearance diagram for an English road limits the width of the locomotive to about 81/2 feet and the height to about 13 feet, as against 10 feet and 151/2 feet in this country. Hence outside cylinders of more than a certain diameter cannot be used and the diameter of the inside cylinders is, of course, restricted by the clearance between the frames. The four-cylinder locomotive opens up some escape from these restrictions, although, if the cylinder capacity be enlarged, it will always be a problem to find space for the bigger boiler which will be necessary.

BILL TO INCREASE THE PATENT OFFICE FORCE.

Notwithstanding the great interest in and the steady stream of appropriations now being made for "The 'Indiana,' 'Oregon' and 'Massachusetts' sub-military and naval purposes, it is to be earnestly hoped of peace." "The turrets of the 'Kerasage' (sic) and ditional sum for the needs of the Patent Office will not proposed measure.

The bill presented in both branches of Congress by Mr. high seas," and "its crew cannot sleep on board for Platt, of the Senate Committee on Patents. S. 4168, and lack of space." The "Miantomoh" (sic), "Monadnock" Mr. Hicks, of the corresponding House committee, H. . an eccentric and senseless idea." We are further year, which, it is pointed out, is only a small proportion informed that the stability of the "Baltimore" and of the excess of fees over expenditures, in accounting for 'Philadelphia" is endangered by their heavy guns, the moneys annually paid into the government by inand that the armored deck of the "Cincinnati" and ventors, manufacturers and owners of patents. To ilher class "is a source of danger, rather than of de- justrate the particularity with which the bill has been tional employés shall not exceed four principal examiners, four first assistant examiners, four second assistant examiners, eight third assistant examiners, eight fourth assistant examiners, four first-class clerks, four copyists, six laborers, six assistant messengers and six messenger boys. It will be admitted, we think, that the business of the Patent Office has been looked into with great attention to detail when so modest an appropriation therefor is so specifically guarded. But we hope that, with such inspection of the business, it did not fail to impress itself upon the members of the Committees on Patents of both branches of Congress that the present quarters occupied by the entire force for the prosecution of their work and the keeping of the necessary records are altogether too cramped and overcrowded for room and better facilities, especially a well equipped tional force of examiners, clerks, etc.

The especial reason for bringing forward this bill at brought under the civil service law. present is found, not in the well-known fact that the Patent Office to see that an invention for which applibefore the invention made by the applicant, and, acough and complete as to insure the issuance of patents were governed by the rules of the civil service. only for such inventions as are unquestionably new; so that the patent when issued shall be an affirmative statement, certified to under the seal of the Patent Office, that the invention covered thereby is new, and has not been described in any patent or printed publiof technical publications—the effort to do which is midwinter. Higher up glows Capella with a softened already constituting a great drag on the work of the radiance, while the Milky Way stretches, like a vernal the business and the increased number of applications north, Vega, appears rising in the northeast. which will be filed when it is assured that action upon them will be prompt and thorough."

THE FRUITS OF CIVIL SERVICE REFORM.

period of about fifteen years, and each succeeding year two hours after sundown. At the beginning of the open to all, sending five minutes, with prizes for rehas given stronger proof of its value in the practical remonth Mercury is in Pisces; at theend, when it passes sults which have been achieved. In its recent annual report the Civil Service Commission points out that the merit system, as compared with the patronage system, ing more conspicuous, as it moves out of the neighboris both more economical and more efficient. This is hood of the sun. It is not far west of Mercury at the conclusively shown in a comparison of the few changes opening of April, but, after the latter turns in its in employes under the merit system, as compared with course and begins to move sunward on the 10th, the two the many removals under the patronage system. During five years preceding the classification of the New York Custom House there was an average of 275 removals per year, whereas during the past two years the | that time on Mercury will cease to be a conspicuous removals averaged only 50 per year and the resignations 30 per year. The figures for the civil service of the whole there. Notwithstanding Mr. Percival Lowell's much country are even more conclusive, for 75 per cent of exploited observations and theories, there is, as yet, no those holding unclassified positions were removed, good reason for not regarding Venus as the most earthwhile in the classified competitive service only 85 re- like of all the planets that circulate within or without signed. During the fifteen years of civil service reform, the orbit of our terraqueous ball. The observations of 249 words with 14 errors in five minutes. An interestthe positions which are politically controlled have in- it to be made during the present year should be of increased 37 per cent in number and 43 per cent in cost, tense interest. At the beginning of the month Venus while the number of classified positions not subject to is in Pisces and at the end in Taurus, near the Pleiades. such control has remained the same. The economy of the merit system is further illustrated by the fact that sun for easy or satisfactory observation. It moves in the extension of the civil service rules in May of last the course of the month from Aquarius to the border of year, by which a large number of hitherto unclassified | Pisces and Cetus. positions were brought under the merit system, led to the abolishing of a number of positions which were found to be quite unnecessary.

the merit system, on the ground that it renders employes too independent and encouraged carelessness in ject for the possessor of a telescope. It rises before fighting strength. They are of 11,525 tons displacethe performance of their duties, a rule was approved by sunset, and, as the evening advances, moves up the ment and 16 knots speed, and protection is afforded by the President in July of last year which prohibits eastern sky clothed with the majesty proper to the removals except for cause and upon written charges. mightiest of the planets. On the general question we think that it is very doubtful if any serious trouble of this nature has ever arisen. looks at the heavens except by chance. If it has, it is immensely outweighed by the excellent results which have been secured, and it is a fact that the new rule has met with general public approval. It is like that?" argued that while the new rule in no way interferes with the proper exercise of discipline, it prevents abuses, guards against unjust removals, and insures that per-inomena of Jupiter's satellites on the night of the 17th. CAN of January 29, 1898.

good behavior.

One of the strongest arguments against the political number of years, and the appointments being made on | the disk and will occupy two and a half hours in crossstrictly political considerations, the new incumbent may or may not have any qualifications for the special duties of his position. An equally serious drawback is the fact that the return of a political party to office is certain to deprive the government of the services of a greater or less number of employes who, during their service, have acquired valuable experience and efficiency. These points are dwelt upon at considerable length by the commission, who recommend that the scope of the civil service law be extended to embrace all positions the attainment of the best degree of efficiency. More to which it could be applied with advantage. It is specifically suggested that the municipal service of laboratory, are quite as urgently called for as the addi- the District of Columbia, the staff of the Congressional Library, and the clerical force of the next census be

Apart from the abstract principles involved in the Patent Office has been overworked for years, and the question of removing the civil service from the field of issue of patents thereby greatly delayed, but in the politics, with which in the nature of things it has no need which has arisen, as a consequence of the act of proper connection, the financial aspects of the problem March 3, 1897, for a more perfect revision and classifica- are of the highest importance. This is evident when tion, by subjects matter, of all letters patent and we bear in mind that the total salaries paid out annuprinted publications which "constitute the field of ally to the employes in the executive civil service search in the examination as to the novelty of inven- amount to close upon \$100,000,000. Bearing in mind tion for which applications for patents are or may be the statement in the report already referred to, that filed." It is now made especially the duty of the since 1882, the year of the organization of the committee, the unclassified positions under political control cation for a patent is made shall not be patented or have increased in cost 43 per cent while the classified described in any printed publication in any country positions have remained the same, it will be seen that civil service reform has an important bearing upon the cording to the report of Mr. Hicks, it is the intention finances of the country. Of the 178,717 employes in the by this appropriation to enable the Commissioner of executive civil service shown by a census of them ta-Patents "to make examinations in a manner so thor- ken last year, about one-half were in positions which

THE HEAVENS IN APRIL. -BY GARRETT P. SERVISS.

The mild nights of early spring are adorned with constellations less brilliant than those of winter, but cation." It will be seen, therefore, that the design is not less beautiful. Orion and Taurus appear, in the to enable the Patent Office to make competent examifirst half of the night, setting amid the lingering nations of the whole field of invention-embracing more twilight, robbed of the dazzling brightness that charthan a million issued patents and a vast accumulation acterized them when they were on the meridian in office, which is now from two to seven months in mist, across the sky from north to southwest. Overarrears, and it being evident that "the office is strug- head, south of the zenith, is Leo, and north of the gling with a load much too heavy for it to carry." The zenith the Great Dipper. Virgo is conspicuous in the Commissioner expects that, with the additional appro-east, and Arcturus, high and splendid, counterbalances priation, "the income of the office will be greatly in- Capella on the other side of the meridian, while, as May, the Board of Control will hold a Fast Sending creased by the more rapid and thorough disposal of Sirius is setting in the southwest, the Sirius of the and Receiving Tournament which is intended to sur-

THE PLANETS.

Mercury is an evening star, and there will be no betteropportunity to see it this year than that presented about the 10th of April, when it will attain its greatest Civil service reform has now been on its trial for a elongation east of the sun, and will not set until almost record; sending five minutes. Championship class, between the earth and the sun, in Aries.

Venus also is an evening star, and gradually becomplanets will draw nearer together, coming into conjunction on the 18th, when Mercury will appear between three and four degrees north of Venus. From object in the sunset sky, leaving Venus to reign alone

Mars is in the morning sky, and still too near the

Jupiter in Virgo, near the star Eta, is a magnificent sight for all who can appreciate the wonder and beauty of celestial phenomena. Recent telescopic study has In spite of the objection which has been urged against revealed the formation of new spots among its great and "Kentucky." They are an improvement upon the colored belts, and at all times it is an entrancing ob-

"What is that bright star?" asked a man who never

"The planet Jupiter."

"Why, I never saw such a star! Do they often look

"Not many of them."

Possessors of telescopes may watch interesting phe-

manence in office shall depend upon efficiency and At 8:15 o'clock, Eastern standard time, Satellite I. will disappear, eclipsed by Jupiter's shadow. At 8:21 P. M. Satellite II. will begin to transit the disk of Jupisystem is that the tenure of office is for only a limited | ter, and at 9:22 its shadow will follow the satellite upon ing it. On the night of the 28th an interesting observation may be made showing the effect of the position of the sun on the direction of the shadows of Jupiter's moons in relation to the line of sight between the earth and Jupiter. At 7:34 P. M. Satellite III. will pass upon the disk and begin a transit which will end at 10:15. But the shadow of the satellite will be so inclined to our line of sight that it will not appear on the disk until twenty-one minutes after the satellite itself has completed the transit.

> Jupiter is very close to the celestial equator, and crosses it, moving northward on the 8th.

Saturn, whose rings are now admirably placed for observation, can be seen in the east, rising at the end of the month near 9 o'clock; but it will be much better situated for evening observation in May. It is in Ophiuchus, near Scorpio.

Uranus is near a little pair of stars, the Omegas, in Scorpio, and gradually gets closer to them in the course of the month. It rises half an hour or so ahead of Saturn. Its approach to the Omegas will be interesting to watch with a field glass or a small telescope.

Neptune, invisible to the naked eye, remains in

THE MOON.

The moon is full on the afternoon of the 6th of April, and in last quarter on the morning of the 13th. The new moon of April occurs on the afternoon of the 20th, first quarter following on the evening of the 28th. The moon is nearest the earth on the 9th and farthest from it on the 25th.

The greatest eastern libration occurs on the evening of the 3d and the greatest western libration on the morning of the 17th.

The moon's conjunctions with the planets occur as follows:

Jupiter on the 5th. Uranus on the 9th. Saturn on the 10th, Mars on the 17th, Mercury on the 21st, Venus on the 21st, Neptune on the 24th.

There are several recognized meteoric showers in April, of which one, occurring on the 20th, may be worth observing. The meteors radiate from a point a few degrees west of the brilliant Vega, in the constellation Lyra

FORTHCOMING TELEGRAPHIC TOURNAMENT.

During the electrical exposition which is to take place at Madison Square Garden during the month of pass any contest of the sort that has yet taken place. As at present arranged, the events include:

A message class for receivers, transmission thirty minutes, receivers to use typewriters of their selection. Novice class, open to persons not having an official ceivers. Ladies' class, free for all, sending five minutes. Two-forty-word class, open to those not having an official record of 240 words or better, sending five minutes. Two-thirty-five-word class, open to all who have not an official record of two-thirty-five words or better, sending five minutes. Two-thirty-word class, open to all who have not an official record of two-thirty words or better, sending five minutes. Two-twenty-five-word class, open to all who have not an official record of twotwenty-five words or better, sending five minutes.

The judges of the contest will include leading officials of the great telegraph companies and the editors of several leading electrical papers.

The best official records in contests of this kind were made in 1893, F. J. Kihm and F. L. Catlin sending 248 words without an error, and R. C. McCready sending ing feature will be furnished by Thomas A. Edison, who will make a phonographic record of the best transmissions, thus enabling contestants to listen at any time to the record of their own work,

LAUNCH OF THE BATTLESHIPS "KEARSARGE" AND "KENTUCKY,"

On Thursday, March 24, there were launched at the Newport News shipbuilding yard the two most powerful ships of the United States navy, the "Kearsarge" "Indiana" class, which they exceed in size, speed and 16½ inches of steel on the belt and 15 inches on the barbettes and turrets. The main battery consists of four 13-inch and four 8-inch guns, and there will be fourteen 5-inch guns in the secondary battery. The most remarkable feature of these ships is the doubledeck turrets, the 8-inch guns being mounted above the 13-inch.

For a very full description and illustration of these ships the reader is referred to the SCIENTIFIC AMERI-