Scientific American.

ESTABLISHED 1845

MUNN & CO., - - - EDITORS AND PROPRIETORS

No. 361 BROADWAY, - - NEW YORK.

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NEW YORK, SATURDAY, APRIL 2, 1898. ____.

Contents.

(Illustrated articles are n	narked with an asterisk.)
Alaska, government hterature on	Launch of "Kentucky" and "Kearsarge"

TABLE OF CONTENTS OF

No. 1161.

For the Week Ending April 2, 1898.

Price 10 cents. For sale by all newsdealers.

PAGE I. ANTHROPOLOGY.-The Postal Service of Australian Aborigines

- 18556
- 18563 18553
- 11. A VIATION.-The Solution of the Flight Problem.-An interesting article dealing with the flight of birds from a scientific standpoint.-5 illustrations.
 12. BIOGRAPHY.-Sir Henry Bessemer.-A full account of the life and work of this great metallurgist and invention.-It traces in detail all of his important inventions.
 13. CRAMICS.-Bernard Palissy and His Art.-An interesting account of the life of this great potter, with a view of his furnace discovered a few years ago.-1 illustration. 18559

Scientific American.

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 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 vard 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

> "The 'Indiana,' 'Oregon' and 'Massachusetts' submilitary and naval purposes, it is to be earnestly hoped 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 adof peace." "The turrets of the 'Kerasage' (sic) and ditional sum for the needs of the Patent Office will not '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 171/2 knots), and that at this speed "it shipped up any such idea of false economy in opposition to the proposed measure. water at the bow." The bill presented in both branches of Congress by Mr. The "Katahdin" "cannot go into battle on the 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. 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 . . 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 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.

[APRIL 2, 1898.

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 States as in the very one which has good reason just, of which were driven by a pair of inside cylinders and 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 $12\frac{1}{5} \times 24$ 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 ontside 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 $8\frac{1}{2}$ 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.

a list of the shortcomings of the ships is added, from Notwithstanding the great interest in and the which we select the following : steady stream of appropriations now being made for

uiscovereu a rew years ago.—1 illustration	10000
VII. ELECTRICITY.—Photographic Investigation of a 150,000 Volt	
Power Discharge.—By CHARLES PROTEUS STEINMETZ.—This in-	
teresting article is illustrated by engravings taken from photo-	
graphs showing disruptive discharges at very high voltage5	
illustrations	18561
Electric Casting	18540
Electric Casting VIII. MARINE ENGINEERING. – De Kermode's Rudder Mech-	10000
anism -2 illustrations	18562
anism2 illustrations. IX. MECHANICAL ENGINEERINGMachine for Automatically	10004
Shaping the Edges of Iron Plates1 illustration	18553
Tests of Bicycle Wheels.—This article gives information re-	10000
garding some interesting tests of bicycles and parts of bicycles.—	
allustrations	10680
4 illustrations. The White & Middleton Gas Engine.—2 illustrations	10:330
The white & Miduleton Gas Engine2 industrations	18995
X. METALLURGYThe Annealing of CopperBy G. WYCKOFF	18676
CUMMINS.	10000
Sir Henry Bessemer.	19222
XI. MISCELLANEOUS:	11.570
Engineering Notes	18076
Miscellangous Notes	18008
Selected Formulæ	18558
XII. NATURAL HISTORYThe Egg of the Dung BeetlesAn	
article giving information concerning one of the most curious	
insects4 illustrations	18551
XIII. PATENTS. – Abstract of Report of the Commissioner of	
Patents for 1897. — The development of industries through	
patented inventions.—The continuation of Judge Greeley's re-	
portThis installment is particularly important, as it gives facts	
relating to the development of industries to patent inventions.	
including electric railway, the telephone, the bicycle industry,	
the typewriter, amateur photography, cash registers and cash	
carriers, basic steel, aluminum and other new industries	18554
XIV -SIGNALS - Antiquity of Signaling	18552
XIVSIGNALSAntiquity of Signaling XV. TECHNOLOGYThe Manufacture of OxygenA description	10000
of the French plant for manufacturing oxygen on a large scale	
3 illustrations	18556
3 illustrations	
interesting account of Germany's large protectorate in the Pacific	
Ocen _A illustrations	18549