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Contents.

(Illustrated articles are marked with an asterisk.)

OUR NAVY.

The Secretary of the Navy has, each year since the commencement of the first term of President Grant, earnestly endeavored to impress upon Congress and upon the country the vital necessity of preserving the efficiency of our diminutive navy. Congress has, at last, taken up the matter and is considering the advisability of authorizing the construction of a number of new vessels of war.

There can be no doubt, in the mind of any thoughtful citizen, that the United States requires a navy, and that it will require one so long as we have commercial relations with foreign countries, so long as we are liable to become involved in war with other maritime nations, and so long as a large share of the great work of exploring distant parts of the globe can be best and most economically performed under the auspices of our navy department.

How large and of what character, this navy of ours should be, is not so easily decided. We must, certainly, have a number of cruising vessels to do the work which falls to our navy in time of peace, and this work may be done by ships of comparatively light armament, of full sail power, and of good speed under steam: by such vessels, it can be done efficiently.

We believe that there is not a vessel in our navy which possesses all of the requisites of such a class of ships. The "Wampanoag" class had the speed, the sail power, and the necessary armament, but were originally defective in their machinery, and are now generally worthless in consequence of the decay and weakness of their hulls. It is to make good our deficiency here, we presume, that the Secretary of the Navy proposes building ten new vessels. They are evidently urgently needed, and it is to be hoped that they will be built and built quickly. In justice to the Department, to Congress, and to the people who pay for them, it is to be hoped that they will, when completed, embody the very latest and best modern practice. They should have iron hulls; economical, simple, light and durable machinery, and an armament that shall not be rendered inefficient by deference to the hobbies of any enthusiastic inventor or of any single man. The plans should be invariably endorsed by properly constituted boards, who should be authorized and required, also, to consult experts, of generally recognized standing, in relation to all plans. Such a course would protect the navy department from malicious or ignorant misrepresentation and abuse.

We learn from the annual reports of the secretaries of our navy, commencing as far back as the administration of Gideon Welles, that our iron-clad navy, originally created under the pressing exigencies of civil war, and, as a matter of course, to some extent defective in design and hurriedly constructed, has become as worthless as the first class of ships. The Dictator is the most formidable of our iron-clads; but even the Dictator is of slow speed as compared with more recently built foreign vessels, has far less invulnerable armor, and is equally inefficient in her armament. Once the most powerful and formidable of iron-clads, she is, to-day, comparatively weak. This vessel, and others of our iron-clads, should not be allowed to become utterly worthless for want of proper care; but we question seriously the policy of building a new iron-clad fleet to compete with that of England, of Prussia, or even of Spain. We are by no means certain that the day of iron-clads has not already passed, and that the perfection of our various systems of using torpedoes for both attack and defence may not have already rendered us independent of such terribly expensive engines of war.

A new fleet of effective iron-clads, if built, should consist of not less than twenty vessels, each capable of meeting successfully the strongest foreign-built iron-clads, and would cost thirty millions of dollars.

Such a fleet might defend our shores and might successfully contend with all existing iron-clads, but it could not prevent the destruction of our limited commerce by fleets of fast, lightly-armed cruisers, and it could not enter or seriously threaten an enemy's port well defended by a system of torpedoes.

Abroad, the unarmored, lightly armed and fast vessels, which it is now proposed to build, could best destroy an enemy's commerce, and would easily avoid heavily armed cruising iron-clads, since the latter must always, of necessity, be defective, either in speed or endurance, or both.

At home, we are already safe against attack, thanks to the intelligence and energy of the torpedo corps of both army and navy.

The exigencies of our late civil war gave rise to these now well organized and effective organizations.

It would be impolitic to make public the results of their unremitting and very fruitful labors. The only suggestion that need be made is that, to still further increase their efficiency, the best talent of the naval engineer corps should be better utilized in this now vitally important work than it has yet been.

In brief, we may state that, in the event of our becoming involved in war with the most formidable of foreign powers, our harbors would be at once rendered inaccessible to the most formidable fighting machines yet put afloat, and this, too, at comparatively slight expense. Were all the fleets of the world to attack New York harbor, not one vessel would be likely to pass the Narrows. A fleet lying off the coast would be unsafe during the day and could be scattered or destroyed during a single night.

A worthy successor of Farragut would find means of destroying easily the most powerful of an enemy's fleet with the resources which are now made available by our torpedo corps.

We have fixed torpedoes that may be made to explode when struck by an enemy's ship, others that may be exploded from secure stations far away at any instant desired, others that may be rendered harmless when our vessels are passing among them and which may be then made to destroy any pursuing vessel that may attempt to pass them: and we have torpedo vessels that can be sent out without a single human being on board to attack a fleet anchored off the shore, and, directed from the shore, they will approach and explode a charge of powder under any vessel that it may be desired that they should destroy.

We may rely upon our torpedo corps, with confidence, to defend our shores and harbors against the world.

Let us have our cruisers, therefore; but let us hesitate before commencing to build iron-clads. We may find that the expenditure of many millions, in attempting to rival other nations, may be saved us by the comparatively inexpensive operations of well organized torpedo corps, and by the application of the wonderful ingenuity of our inventors to the perfection of floating and sub-aqueous torpedoes and torpedo ships.

The inventive minds of some of our readers will find here an interesting field in which to labor, and they may accomplish results of value to the nation while attacking a problem which, nearly a century ago, gave Hopkinson the text for his humorous poem, "The Battle of the Kegs," and with which Bushnell and Fulton made creditable progress at a very early period in the history of our country.

THE MOSCOW EXPOSITION.

The great Russian Exposition at Moscow was recently closed, and, according to a correspondent of the *Engineer*, the United States were extensively represented in the mechanical department; not, however, by goods sent directly from this country, but by machinery made in Austria, Prussia, Belgium, Russia and other countries, copied from American patterns, the products of American genius, protection for which by patents in the countries specified is practically denied to our citizens. At this exposition, the show of American sewing machines supplied from Germany was quite large. The correspondent says:—"If that benefactor of mankind, the ingenious Howe himself, could have appeared in the flesh and visited the Exposition, I think he would have been highly gratified, for the pet offspring of his genius, in some form or other, is continually to be met with, it being more difficult to say where it is not than where it is."

The entire motive power of the exhibition seems to have been furnished by the American Corliss steam engines, examples of which were supplied by several German manufacturers. Indeed, so many of these engines were to be seen in the exhibition that the correspondent is led to ask: "I wonder if the inventor reaps any advantage from this patent in Germany?"

This is only one of hundreds of examples of the way in which the Germans, especially the Prussians and Austrians, appropriate the best improvements of English and American inventors.

Our Commissioner, General Van Buren, in his endeavor to procure a large appropriation from Congress to be wasted in Vienna, is endeavoring to satisfy the members that unless the money is granted the United States will not be duly represented at the coming Vienna show. But Congress need not give itself any apprehension on that score. The ingenuity of America will be well represented in all the mechanical departments, by the pirating manufacturers of Austria and Germany. No nation in the world will have its mechanical ideas so largely represented at Vienna as the United States; but our countrymen will not specially profit thereby

But to return to the Moscow affair:

Among harvesters, the Johnson American Self-raking Reaper is specially mentioned. As to steam fire engines, the first prize has been, as stated to have been, awarded to an American machine.

The display of war material was quite large, some very ancient and curious pieces, of Russian origin, being exhibited. Among these were queer shaped revolving mitrailleurs, having from twenty-four to forty-four barrels, five feet long and three quarter inch bore. These were made in the time of Peter the Great, but were discarded by him as impracticable. A brass rifled cannon was shown, which was cast in 1615—a hundred and fifty years nearly before the idea of rifling guns was known in England. A rifled arquebuse made in 1661, several breech-loaders, and a revolving gun of the seventeenth century were also on exhibition.

A SLIPPED ECCENTRIC AND WHAT CAME OF IT.

A correspondent in Connecticut, who writes to announce the sending of an excellent list of subscribers to the SCIENTIFIC AMERICAN, shows how our paper has practically benefitted him and his employers as follows:

"I have taken the SCIENTIFIC AMERICAN for nine years. When I first commenced to run a steam saw mill, I worked by the day as sawyer. One day the eccentric slipped on the shaft, and the engine, of course, stopped. The proprietor being away, we were in a bad fix. The fireman did not know how to set it again, and, practically, I knew nothing about it myself; but I recollected reading in your paper the rule for such an engine (a common slide valve one). So I tried my hand and succeeded, the engine doing better work, with less fuel, making a gain of three cords of slabs in ten days."

To the practical workman the regular reading of the SCIENTIFIC AMERICAN is unquestionably of great value. It insensibly educates the mind of the reader and, if he is a workman, renders him more intelligent, more skillful and more useful to his employer. It is the custom in some establishments for employers to present their workmen on the return of each new year with a year's subscription to the SCIENTIFIC AMERICAN. Proprietors find themselves abundantly repaid in the greater industry and superior work which their men give back in return for such attentions. Those who have not already done so should remember that now is the time to register subscriptions to our paper. This is the first number for 1873.

Send in the names as fast as possible.

PROFESSOR TYNDALL AS A MONEY MAKER.

During the evening of Professor Tyndall's first lecture in this city, while he was busy in exhibiting the wonderful qualities of light at the Cooper Institute, a thief struck a light in the Professor's room at the Brevoort Hotel and carried off $200 in gold from the Tyndall trunk. But that, after all, is a small item when we consider that the Professor is bagging about ten thousand dollars a week from his lectures, one of which he gives every other night.

If other scientific lecturers would bestow as much personal attention upon the preparation of their public appearances as does Professor Tyndall, it is probable that the demand for their services might be increased. There is never any hitch or break in the experiments, illustrations or speaking of Dr. Tyndall. The day preceding each lecture is devoted to a careful rehearsal of the experiments that are to be produced, and his assistants are drilled in the manipulation of the apparatus by their leader with the same care that the leader of an orchestra bestows in the rehearsal of his music.

Work and watchfulness are the keys to Professor Tyndall's experimental success as a lecturer.

THE VIENNA SHOW IN CONGRESS.

After a somewhat lengthy debate, a bill appropriating the sum of $100,000 to defray the expenses of American representation in the Vienna Exhibition has passed the House of Representatives and has been forwarded to the Senate for its concurrence. In addition, two naval vessels have been designated for transport duty, to carry pianos, sewing machines, buggies and other goods of exhibitors to Trieste, Austria. Space forbids our entering into any *resumé* of the discussion in the House. The bill was introduced by Mr. Banks of Massachusetts, and the opposition was led by Mr. Shellabarger, of Ohio. The latter gentleman made an able argument against the grant of the appropriation until the Austrian patent laws should be so modified as to protect American inventors; but the bill passed without this proviso, so that it now remains for the Senate to determine whether we shall allow this golden opportunity of testifying to the world our condemnation of these unjust and oppressive regulations to escape.

The amendment offered by Mr. Shellabarger, although it is a step in the right direction, hardly, in our opinion, covers the entire requirements of the situation. What we need and insist upon is not a protection merely for the limited duration of the show, but a permanent guarantee, ratified in solemn treaty obligation that the rights of our citizens in Austria, in respect to their inventions, shall be upheld the same as are the rights of Austrians in this country.

We earnestly trust that an amendment framed in this view will be introduced and favorably considered in the Senate. It is but a simple act of justice, it works no hardship to any one, and secures to us advantages that are inestimable. We have repeatedly shown that, in other continental countries, patent laws exist as oppressive as those of Austria. The latter nation is deeply anxious to procure a full representation of American genius, and, were such an amendment enacted, there is little doubt but that the objectionable features