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FIFTEEN THOUSAND PATENTS SECURED THROUGH OUR AGENCY.

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MUNN & Co.,
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TO OUR FRIENDS.

NOW IS THE TIME TO FORM CLUBS.

Only two more numbers after the present and another volume of this journal will be closed. We appeal to its friends in all sections of the country where mail facilities exist to endeavor to form clubs for the coming year. We feel justified in asserting that no other journal in this country furnishes the same amount of useful reading, and especially at the extraordinarily low price at which it is furnished. Ten persons can club together and get the paper at \$1.50 each for one year. Twenty persons clubbing together can have it at the rate of only \$1.40. Think of getting a volume of 832 pages of useful reading matter, profusely illustrated with between 500 and 600 original engravings, for such a small sum of money. Single subscriptions, one year, \$2; six months, \$1. Even though the times may be hard, the long winter evening must be relieved of its dullness, and we must keep reading and thinking, and thus be prepared to overcome temporary difficulties and open new channels of wealth and prosperity. Friends, send in your clubs; at least renew your own subscriptions promptly.

See prospectus on the last page of this sheet.

OUR COUNTRY AND THE SCIENTIFIC AMERICAN.

In the ways of Providence, peace, industrial progress and international comity sometimes happily prevail and extend for a period of many years. Then again there will come fearful changes, in which the very fabric of society will appear to be torn up and shattered, and war, with all its attendant evils, will pass before us in dread reality. We are living witnesses of such scenes and convulsions in our own land. In the history of the world, the United States of America, in origin and progress as a nation, appear almost like a splendid miracle as compared with other nations. Within less than a century we have sprung into

independent existence, and from dependent colonies, containing about three millions of people, and a domain confined along the fringe of the Atlantic shores, we have grown to be the second greatest commercial nation in the world. Our empire extends from ocean to ocean, embracing every variety of soil and climate, and our people number more than thirty millions. Our cities have sprung up, rivaling in extent and wealth those of the old world; and as regards power, intelligence, unity and all the great blessings of civilization, we called ourselves, perhaps truly, "the most happy people in the world." But evil times have now fallen upon us, so far as human vision can discern, and civil war "has been met as a stern necessity" by our regular and established government. We are engaged in grappling with the most gigantic rebellion on record, and all institutions, classes and interests are deeply interested in the issue; but we confidently hope that good will ultimately result from present evil. The SCIENTIFIC AMERICAN, like all its cotemporaries, has experienced depressing influences, but it still rears an unaltered front. Its entire subscription in the Southern States has been destroyed, and in a pecuniary sense the effect of the conflict has been very severely felt. Yet, although several of the daily, and many of the weekly papers in New York and other places have finally succumbed to the pressure of the times, or have curtailed their dimensions and reduced their expenses to maintain an existence, the SCIENTIFIC AMERICAN has gone forth to its subscribers weekly, the same in dimensions as formerly, and more elaborately illustrated than ever. Our great efforts to maintain its usefulness for literary, scientific and mechanical excellence, we believe will be appreciated by our readers, who, we hope will use their influence in a special manner at the present time to extend its circulation among their friends. If each reader would induce one neighbor to become a subscriber our Southern list would be more than redeemed. The price of subscription is only one dollar for six months. Even in these hard times, we do not know where a mechanic can make such a profitable investment of one dollar for half a year or two for twelve months.

In three weeks hence this volume will be concluded. We trust all our old subscribers are making preparations for a renewal accompanied with like remittances from many friends. We most earnestly appeal to the friends of the SCIENTIFIC AMERICAN to come forward now and show their regard for it. The publishers would strongly urge upon their numerous friends not to forget them, even in time of war.

HARBOR DEFENCES—MARTELLI TOWERS.

We notice that the good people of Philadelphia are somewhat alarmed respecting the defenceless condition of the river approaches from the sea to their goodly city. A correspondent of one of their daily papers has made the startling suggestion that the steam frigate *Merrimac* may steal out from Norfolk some dark night, enter the Delaware, ascend the river under a false flag, and lay Philadelphia in ashes within thirty hours after leaving the Chesapeake. This is more easily said than done, but it could be done with impunity so far as the defences of that city are concerned. Many of the leading men of Pennsylvania seem to be apathetic on the subject of harbor defences, but not the people of Philadelphia. Their daily papers are discussing the question in its various aspects, and several contributors have presented their views upon it. Different kinds of defensive military works are proposed, and among the number martello towers. It is suggested that several of these be erected on favorable situations along the Delaware river, and mounted with large Rodman guns. A single shot from one of these huge pieces of ordnance striking a war ship—it is stated—would sink her, and from this assertion the conclusion is drawn that such towers armed with such guns would form the best modes of harbor defence. Perhaps this is true and perhaps not. The officers of the engineering corps, U. S. A., are the best judges of these things, and we exhort the people of Philadelphia to submit all such propositions to a proper board before they adopt any plans for protecting their city. When there appeared some probability of a war between the United States and Great Britain, arising out of burning the steamer *Caroline* in the Niagara river, in 1837, we remember that it was pro-

posed to erect a great tower, several hundred feet in height, in New York city, and mount it with a monster gun, so as to sink every war vessel that might pass the batteries at the Narrows. If we can form an estimate of the utility of such towers from the condition of those in England, they must be useless structures. They are tall circular buildings of masonry, and a great number of them were erected along the British coast at the beginning of the present century for defense against the anticipated invasion of Napoleon. Their name is supposed to be derived from such a tower, that once gave the English a hard tussle to reduce, in Mortella Bay, Corsica. They are provided with vaulted roofs, and usually consist of two stories—the lower one for stores, the upper one for troops. The wall terminates in a parapet which secures the gunners in working pivot guns capable of firing in any direction. Most of these towers have been dismantled; not one, we understand, is now used as a fort.

The great defect of martello towers arises from their very limited dimensions. When war frigates were no larger than our ferryboats, and when their heaviest guns were 32-pounders, such towers may have been effectual for repelling attacks by sea, but the broad-sides of a single large frigate of the present day, we think, would soon destroy any martello tower that we have seen.

The best structures for harbor defenses are regular casemated forts. The forts at Hatteras Inlet and Port Royal were easily taken because they afforded no protection against the terrific showers of shell that were thrown into them. Had they been casemated and bombproof they could not have been taken so easily.

All permanent works for harbor defense should be casemated structures, but, at the same time, it appears to us that new modes of defense must be instituted for the new modes of attack, so scientifically carried out by Commander Dupont at Port Royal. By the agency of his steam engine the captain of a frigate can shift the position of his vessel continually, and thus baffle the gunners confined in a fort. When sailing vessels were exclusively used in attacking harbor defenses they became fixed targets like forts, and the contest was simply between wooden and granite walls. All this is changed; there is now much less danger of steam frigates being destroyed by land batteries than formerly, and a first-class iron-clad frigate could sail past any of our land batteries at 600 yards distance without being much injured.

To prevent war vessels passing up rivers and into important harbors, huge iron chains have been suspended at some depth across the channel. A boom of this character was thrown across the Hudson river at the Highlands, during the revolutionary war, and several of its links may still be seen in the State Museum at Albany. It was prepared by an ancestor of Col. F. Townsend, U. S. A., and the same agencies may again be used with advantage. There are nine forts and three batteries completed for the defense of New York harbor, and we think it would not be very easy for a hostile foreign fleet to come nigh the city; it is the Long Island and not the Staten Island shore, that appears to us the most inviting for a daring, skillful and powerful foe.

ROCK OIL.

There is nothing in the industrial world at the present time more remarkable than the production of petroleum. That great lakes of this valuable substance should have lain a few feet beneath the surface undiscovered for thousands of years, is one among innumerable proofs that the intelligence of civilization is required to enable man to bring to light and render available the natural resources of the planet which we inhabit. One very curious circumstance in the development of this industry was the tardiness of even our enterprising community to direct their attention to it after it was discovered. In 1826 an account of the Little Muskingum region, in Ohio, was published in *Silliman's Journal*, in which the statement was made that in boring for salt water vast quantities of petroleum was obtained, which was beginning to be in demand for lamps in workshops and manufactories. The writer says:—"It affords a clear, brisk light when burnt in this way, and will be a valuable article for lighting the street lamps in the future cities of Ohio." Though this account was published