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O. D. MUNN, S. H. WALES, A. E. BEACH.

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WHAT CAN BE DONE FOR INVENTORS.—ADVICE GRATIS AND ADVICE FOR PAY.

For the information of our new subscribers, we would state that it is the custom, at the office of this paper, to examine models or drawings and descriptions of alleged new inventions, and to give written or verbal advice as to their patentability, without charge. Persons having made what they consider improvements in any branch of machinery, and contemplate securing the same by Letters Patent, are advised to send a sketch or model of it to this office. An examination will be made and an answer returned by early mail. Through our Branch Office, located directly opposite the Patent Office in Washington, we are enabled to make special examinations into the novelty and patentability of inventions. By having the records of the Patent Office to search, and the models and drawings deposited therein to examine, we are enabled to give an inventor most reliable advice as to the probabilities of his obtaining a patent, and also as to the extent of the claim that it is expedient to set up when the papers for an application are prepared. For this special examination at the Patent Office we make a charge of Five Dollars. It is necessary that a model or drawing and a description of the invention should accompany the remittance.

The publishers of this paper have been engaged in procuring patents for the past sixteen years, during which time they have acted as Attorneys for more than FIFTEEN THOUSAND patentees. Nearly all the patents taken by American citizens in FOREIGN countries are procured through the agency of this office.

Pamphlets of instructions as to the best mode of obtaining patents in this and all foreign countries are furnished free on application.

For further particulars as to what can be done for inventors at this office, see advertisement on another page, or address

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STRONG CANNON—AMERICAN BUILT-UP GUNS.

Among the list of claims for re-issued patents, published on another page of the present number of the SCIENTIFIC AMERICAN, are two for improvements in the construction of cannon by the venerable Daniel Treadwell, late Rumford Professor in Harvard College, Cambridge, Mass. The nature of these improvements consist in forming the body of the gun in which the bore is made of one piece, and shrinking thereon, under great strain, steel, or wrought-iron hoops in one or more layers. For example, the core part of the gun is made of cast iron and the outside turned smoothly and then wrought iron, or steel rings, made somewhat smaller than the parts they are to surround, are heated and shrunk on in the same manner that tires are shrunk on wheels. This is a compound

built-up gun, and the principle seems to combine great strength with a small amount of metal. All that is good in the construction of the celebrated Armstrong, and the hooped gun of Capt. Blakely, described on pages 166 and 169, Vol. V. (new series) of the SCIENTIFIC AMERICAN, is the invention of Mr. Treadwell. In 1840 he constructed three 4-pounder built-up wrought-iron guns to test theoretical principles which he had held under consideration for a long time. These guns, when subjected to severe tests, satisfied him that his theory was correct, but in order to carry it out upon an extended scale for larger guns costly machinery was required. Before proceeding to incur further expenditures he visited Washington and had several interviews with Messrs. Upsher and Spencer—Secretaries of War and the Navy—the result of which was a contract for eight 6-pounder field guns and four 32-pounders. In three years after this the foundry and machinery were put up in Boston and the 6-pounder army guns finished. They gave entire satisfaction to Col. Talcott, the Chief of Ordnance. In 1844, the four 32-pounders for the navy were completed, and six others of the same caliber on his own account. All of these not only withstood the contract test, but other tests of a far more severe character. A short account of the manufacture of these guns and the experiments made with them was published in 1845 and circulated in America and Europe—one year after an English patent was obtained through the American consul in London. The guns then made by Mr. Treadwell were the strongest that had ever been produced, but although the War Ordnance Board offered to order a few batteries for the field, the Naval Board gave no further encouragement to the inventor. After expending over seventy thousand dollars on the manufacture of such guns—sixty of which were sunk—the red tapeism which prevailed in Washington led to the abandonment of further operations in their construction. The chief object of Mr. Treadwell was to substitute a light gun of great strength and caliber for the old ponderous cast-iron cannon, and his main reliance was in their adoption for the navy. And now what do we behold within a few years past since the necessity for improved guns has been forced upon all governments? Nothing less than the adoption of Mr. Treadwell's guns in England, Spain and, in some cases, in America. "Other men have entered upon his labors," and Sir William Armstrong could scarcely have been ignorant of his invention. With the exception of the breech-loading and rifling arrangements, the Armstrong guns are in form and construction similar to the American guns built in 1843. The mode of putting the rings together, and the mechanism for executing the work by Armstrong are also similar to the operations and mechanism then adopted and employed.

It is claimed by Mr. Treadwell that the Armstrong, Blakely and Parrott guns are all constructed according to his invention and he believes that such cannon are the strongest in the world according to their weight of metal. One of his 6-pounders, made in 1843, is owned by an inventor in this city, who has fired it times without number, and he has assured us that no stronger gun was ever made. Mr. Treadwell has lately addressed a communication on the subject to the Secretaries of War and Navy, and the Chiefs of the Engineering and Ordnance Departments, directing their attention to the importance of this subject. He contends—and we believe he is right—that his method of constructing guns is most valuable for those of large caliber in order to decrease their weight and enable them to be more easily handled and carried. The government seems to have settled down upon the idea that the very heaviest guns should be made of cast iron. Now, the government which would adopt cast-iron muskets, rifles and pistols would be considered as insane as a railroad company that would adopt cast iron for the boilers of their locomotives. Why? Because cast iron is so weak and unreliable in comparison with wrought iron and steel. Capt. Rodman's method of making cannon with a core having a tube through which a stream of cold water is passed after casting, so as to cool the interior conjointly with the exterior, is admitted to be a great improvement upon the old method of casting solid guns, but Mr. Treadwell contends that the strength of the Rodman guns has been overestimated and overstated in the volume published by government, detailing the experiments with them. He asserts that the method of testing

the pressure of the gunpowder upon them by a small piston driving an edged tool into a plate of copper is incorrect, and that it registered twice the amount of pressure actually exerted upon the gun by the powder. This is a subject which deserves a thorough investigation by those who have charge of the Ordnance Department. Several built-up wrought-iron guns have failed, but this was not owing to the character of the metal employed, which is far stronger than cast iron, but the defective modes which had been employed to unite all the parts together. These defects seem to have been completely remedied by this old American method of fabricating guns, and we are unconscious of any good reason that can now be urged against the use of the strongest metal for such purposes, unless it is its greater cost.

STEAM RAMS.

The term steam ram is applied to a war ship, constructed with a strong projecting horn of iron, extending several feet forward under the water at the bow. The object of such a ship is to strike the hull of an enemy's vessel, ram *a la mode*, knock daylight into her timbers, and send her to the bottom. Such bunting war vessels have received the high approbation of Mr. Ellett, C. E., who has given his opinions to the public on the subject through several papers, and it is stated that all the new iron-clad steamers, for both the French and British navies are to be furnished with these striking appendages. The effective power of a steam ram is in proportion to the strength of its hull, its mass and power of engines, and the power of resisting such a vessel is based upon the same conditions. A small steamer in rapid motion striking one that is much larger would damage the latter most provided the former had a hull of sufficient strength to withstand the shock. No large steamer, however, would stand still and allow one of less size to take it at such an advantage. We have seen it stated that the four new iron-clad vessels to be built for the British navy are to have solid iron horns, extending twenty feet under water. Such statements are not credible, because such a mass of metal at the bow of any vessel would tend to run her nose under water, whereas a vessel to sail well must be trimmed to draw less at the bow than at the stern. And there is no necessity for such a long horn on a steam ram, as it would be liable to get broken by coming in contact with a vessel of equal powers, but having a shorter horn. We believe that all iron war steamers should be built with strong iron bows, to employ them when proper opportunities may occur for running down other vessels. For this purpose their hulls must not only be very strong to withstand the shock of contact, but the engines must be framed and built in the strongest possible manner, or they will be most liable to get broken in such encounters.

RENEWED ACTIVITY AMONG INVENTORS.

Business at the Patent Office is gradually resuming its wonted activity. For the past year firearms, projectiles, camp equipage and other articles pertaining to warfare have absorbed the attention of inventors generally, and, as our columns have borne testimony from week to week, some very valuable and ingenious inventions have been produced and patented, and now perform an important part in the suppression of our rebellion.

We have noticed latterly that many of our inventors are again devoting their ingenuity in the line of peaceful inventions, such as improvements in the steam engine and in agricultural and domestic improvements of various kinds, while there is seemingly no diminution in the line of warlike inventions. The result of thus enlarging the bounds of inventors has greatly increased the business of the Patent Office, and, as our weekly list of claims bear evidence, this department of our government is at present flourishing.

A MODEL IN SUGAR.—The model from which our drawing was made of Peteler's ventilating apparatus, illustrated on another page, was constructed of sugar; and represents the color and grain of the wood with the joints and nails in the most perfect manner.

BUCKMAN'S KNIFE SHARPENER.—The address of the inventors of this utensil is E. & A. Buckman, at East Greenbush, N. Y., and not East Greenwich, as we erroneously gave it.