

The Bursting of the Parrott Guns—Report of the Naval Committee.

The *Army and Navy Journal* contains the elaborate report of the naval committee appointed to consider and report on the subject of rifle cannon for the navy. The report is dated Washington, January 18, 1865. The committee find that seven hundred and three Parrott guns of all callbers have been issued to the naval service, and that of these twenty-one have burst or been otherwise injured by explosion. Several of the injuries have appeared in fracture or rents, enabling the withdrawal of the guns from service in time to avoid casualties, and many of them have occurred in the chase or at the muzzle, and not, as is customary with other guns, at the breech; thus affording evidence that they arose from the premature explosion of shells within the guns—a fact which is proved by the direct testimony of several officers in charge at the time. That these guns have in some instances been injured by other causes than the premature explosions of shells, such as the use of compressed powder, projectiles deemed by Mr Parrott unsuitable for guns of his construction, by keeping guns loaded for a great length of time, and also by the neglect in heat of battle to lubricate the projectiles as required by the ordnance instructions—a most necessary and important precaution, having for its object not only the free movement of the projectile, but particularly as a means of neutralizing the tenacious deposit from the powder—which is admitted in some cases to have been done there seems little doubt; but they are exceptional cases. The committee, however, recommend that as the premature explosion of shells is one, and, in their opinion, the principal cause of the failure of the Parrott guns, experiments should be conducted at Cold Spring, or elsewhere, to place the question of this cause of bursting beyond dispute, and to decide whether it may be abated or not. With this view, the committee give directions as to the manner in which the experiments should be conducted. The result of these experiments will decide the question of retaining in the service, or rejecting, the Parrott guns. Pending this decision, they recommend to the Bureau of Ordnance that a circular be issued, directing certain reductions of the charge of one hundred pounders, and other precautionary measures to be taken. In consideration of the endurance exhibited by the Parrott rifle guns in proof and in service the committee deem it proper to state that in their opinion, the bureau was fully justified in adopting them for the naval service, as the best guns to be obtained to meet its immediate wants—various other systems of cast-iron rifled ordnance, having either failed or been withdrawn from service as unreliable. They therefore, in the belief that the guns of this description which have burst or failed may have been affected by one or more of the causes heretofore enumerated, especially the explosion of shells within them at the time of bursting, or previously, recommended the retention of all classes of those guns, except the 156-pounders, until the experiments herein recommended shall have been made. They also suggest the immediate withdrawal of such of the guns as may have been subjected to any one of the deteriorating causes arising from premature explosions and other causes, and that they be issued to vessels of the navy only as chase guns, not to exceed two for large and one for small vessels exclusive of rifled howitzers. The report, as published in the *Army and Navy Jour.*, is accompanied by voluminous appendices, with valuable tables, by the evidence of Mr. Parrott before the committee, and by a letter from the same gentleman, giving in detail his views as to the causes of the bursting of the guns. Commodores Missroon, Hitchcock, and Hunt, and Lieutenant Commanders Aulick and Jeffers, constituted the Committee.

Steam Fire Engines.

The *Buffalo Advertiser* says:—

Never was the value of our steam fire engines more fully demonstrated than during the recent conflagration. With no sinews to tire or muscles to grow stiff, they stood there, hour after hour, obedient to the fire-men and engineers, sending their never-ceasing streams upon the flames. Even the old "C. J. Wells," which was thought to have grown feeble and useless from age and hard service, was brought into requisition, and did honor to itself and its god-father. When

it was feared that the machines might be disabled from freezing, rude coverings of carpets, old quilts, etc., were erected about them, giving them a decidedly unique appearance. Ever and anon the cheery sound of the steamers' whistles would be heard, as if hailing and encouraging each other amid the storm, and still they worked ceaselessly on.

The Artillery of the Future.

Mr. W. T. Carrington, Chairman of the Society of Engineers, England, made the following assertion on the occasion of his opening address:—

"The time will come when there will be no such thing as a rifled gun—all our guns will have perfectly smooth bores. Then we shall have guns of steel of the least weight combined with the necessary strength. If a smooth bore gun be rifled it is considerably reduced in strength; let the grooves be made as small as possible, still that gun is weakened. Take a cylinder, a beam, or anything that has to resist strains and groove them in a contrary direction to the direction of the strain, as in the case of a rifled gun, and you will find them far weaker and less able to bear the same strains than the cylinder or beam without the grooves, although of precisely the same weight. It is very easy to make a small groove in any beam, and reduce its strength by one half, although its weight is reduced but a fraction. Is it wise, therefore, to weaken the greater number of our guns by grooving them when we can have better results in one sense, from a smooth bore? 1st, there is a much stronger gun from the same weight of metal; 2nd, a less costly gun; 3rdly, a gun simpler and, therefore, more easily kept in order; 4thly, less strain on the gun from the same quantity of powder and same weight of shot; 5thly, greater velocity of the shot when leaving the gun. It can easily be shown that, with the same quantity of powder and weight of metal to be projected, the strain in a rifled gun is greater than in a smooth bore. We must admit that many guns would burst if the shot was so fixed in that it could not move by the force of the powder when exploded—one method to fix the shot would be to screw it in, the inclined plane of the screw being, say, 1 in 24, the gun would certainly burst before this screw slipped. What is a rifle but a screw? Although the inclined plane is very steep, it is a screw, and therefore requires some extra force to make the ball slide on the inclined planes, and this extra strain must of necessity be given to the gun by the same quantity of powder as used in the smooth bore for a greater velocity of the projectile with less strain. What I mean is this:—Possibly the ball or shot may yet be rifled—not the gun. If the rotary motion is given by the rifling of the gun, the ball has the greatest circular motion at the commencement of its flight, and the least at its termination, so that, independent of the objections to rifling the guns, the balls have their own reasons for being rifled themselves. If the money already spent on experiments on rifled guns had been employed in experiments on feathered or rifled balls, satisfactory results might have been obtained. It can only be decided by experiment which method of rifling or feathering the balls, will be best. Many schemes have been proposed. Spiral grooves might give sufficient rotary motion; if not, a short tail, having the necessary twist or screw, or two or more twisted faces on the nose of a shell or shot—which would be acted upon like the sails of a windmill to give rotary motion—or feathers imbedded in the side of the shot until leaving the gun, when they should be made to spring out and give the necessary surface for the atmosphere to give sufficient rotary motion."

[It has always been our opinion that if a rotary motion is to be imparted to the shot at all, it must be given during its passage out of the gun. It is very certain that if shot of any kind are to be made with spiral wings or feathers, they must be long shot and not balls.—Eds.]

Magnesium Light for Dyers.

A dyer of Paris some months ago, saw the magnesium light for the first time, and discovering at once that its rays left colors unaffected, exclaimed "This is just what we have long wanted!" There are many days in winter when those who deal with delicate shades of color are utterly at a loss to discriminate between tint and tint, but the magnesium lamp will, it is thought, answer the purpose of sunlight.

THE RAILROAD UNDER BROADWAY.

We have before us a copy of a report made by A. P. Robinson, Civil Engineer, in relation to the contemplated railroad under Broadway and the Fifth avenue. It is proposed to construct a tunnel 25 feet 6 inches wide, and 16 feet high, under the middle of the street, with two railroad tracks, and with stations half a mile apart. At each station a building is to be erected on each side of the street, with one staircase to ascend and another to descend, under each building. The cars are to be each 40 feet long, besides sufficient space for a steam engine to drive it, and the number of the cars is to be equal to that of the stations, so that cars may start from all the stations at the same time. The cars are to start once in two minutes, and to occupy a minute and a half in running from one station to another. The estimated cost of the work at present prices is \$8,487,000. Application for a charter is now pending before the State Legislature. The report concludes as follows:—

"I can conceive nothing so completely fulfilling, in every respect, the requirements of our population, as such a road with such an equipment, and worked in the manner suggested. There would be no dust. There would be no mud. Passengers would not be obliged to go into the middle of the street to take a car. They have simply to enter a station from the sidewalk and pass down a spacious and well-lighted staircase to a dry and roomy platform. The temperature would be cool in summer and warm in winter. There would be no delays from snow or ice. The cars would not be obliged to wait for a lazy or obstinate truckman. The passenger would be sure of a luxurious seat in a well-lighted car, and would be carried to his destination in one-third the time he could be carried by any other conveyance. These would be the advantages to those who ride, and for the other great public in the streets, there would be no collisions, no clashing, no broken wheels or fractured axles, no frightened horses or run over pedestrians. Everything would be out of sight and hearing, and nothing would indicate the great thoroughfare below.

Curious French Harness.

A French gentleman has patented a new invention for instantaneously releasing runaway horses from carriages. The driver, in case of accident, pulls a strap, by which the trace buckles are loosened and the horses run free with all the harness except the traces, which remain attached to the carriage.

[These Frenchmen always do things by halves. If a Yankee had conceived this idea there would have been an attachment to chase the horses, catch and secure them, and remonstrate with them on the impropriety of their conduct. Eds.]

THE GOLDEN LILY OF JAPAN.—Several specimens of this rare and gorgeous exotic are on exhibition at the mechanic's fair, San Francisco. It is thus described: Imagine upon the end of a purple stem, no thicker than a ramrod and not above two feet high, a saucer-shaped flower at least ten inches in diameter, composed of six spreading and somewhat crisp parts, rolled back at their points, and having an ivory white skin, thickly strewn with purple points of studs, and oval or roundish prominent purple stains. To this add in the middle of each of the six yellow parts a broad stripe of light, satiny skin, and having the appearance of streamlets. From this delicious flower arises the perfume of orange blossoms sufficient to fill a large room, but so delicate as to respect the weakest nerves.

PRESERVATION OF IRON PLATES ON SEA-GOING VESSELS.—The French iron-clad frigate *Invisible* has just been taken into the dry dock at Castigneanu, which has afforded an opportunity of judging of the efficacy of the system applied to that vessel for preserving her iron plates. A band of zinc, which by isolating the electric currents guarantees the plates from that green coating which causes injury, has transformed the nature of that vegetation, and, instead of a casing of marine herbs, there was found attached to the frigate's bottom a fine collection of corals.—*Galignani*.

[Corals must have changed their habits to grow on ships' bottoms. Should not the word be barnacles?—Eds.]

Improved Revolving Hay Rake.

The rake herewith illustrated is of the ordinary kind, with a few exceptions. The operator rides instead of walking, and the load is discharged from the seat instead of by grasping the handles behind, as in the old style. The arrangement for transporting the rake to and fro is also different. The center of the head, A, which carries the teeth has a journal on which the whole rake revolves. There are two cams, B, on the shaft which the stop, C, butts against when at work, and holds the teeth in the proper position. By withdrawing this from the seat, the head rolls over and deposits the windrow with great regularity. There is a spring catch at D which prevents the rake from slipping backward when at work.

Rights to territory for sale in any part of the United States not sold, and in any quantity to suit customers. For any information address H. N. Tracy, Painsville, Vt.

ORDNANCE AND ARMOR.

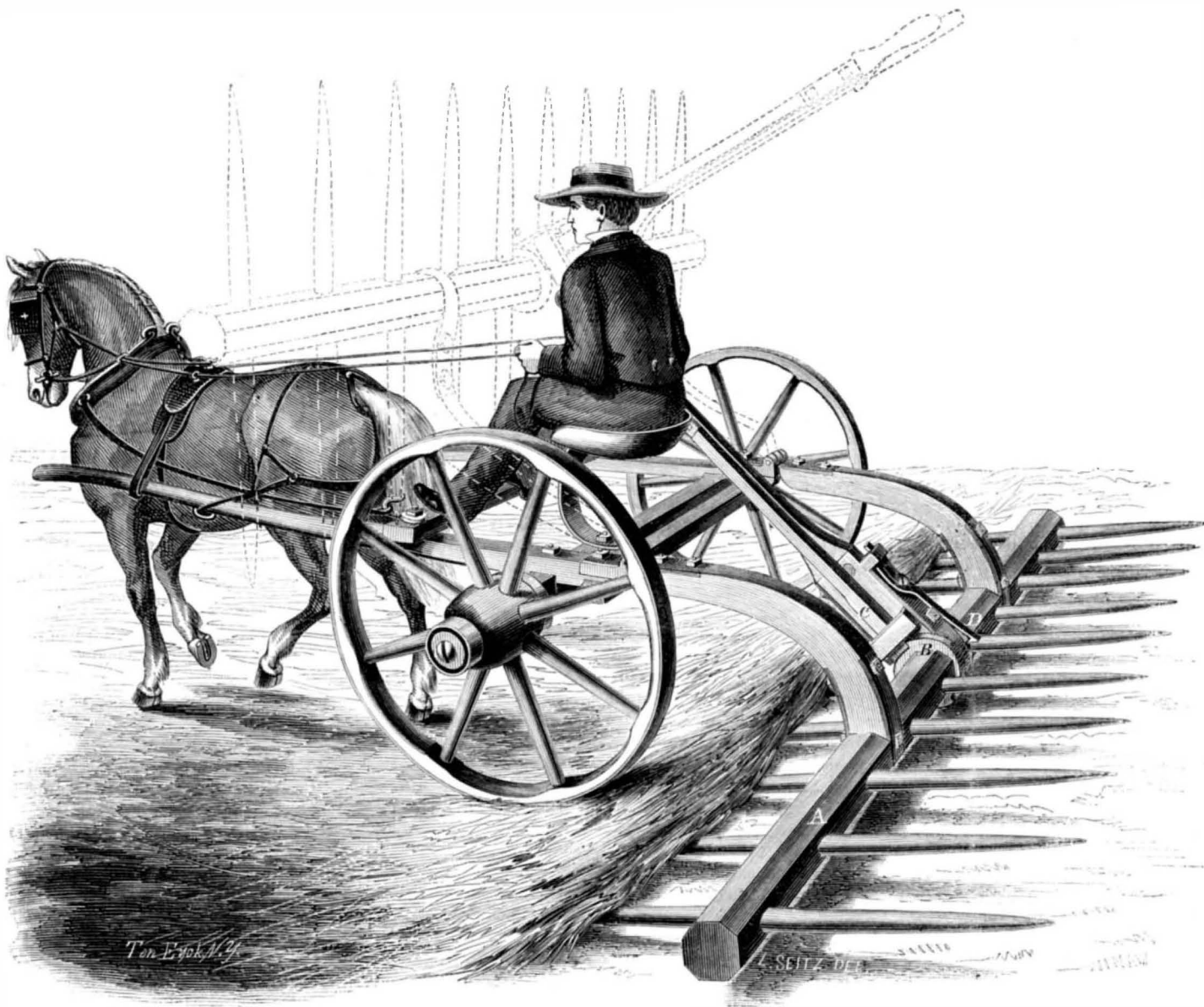
D. Van Nostrand, of 192 Broadway, New York, has just published a treatise on Ordnance and Armor, by Alexander L. Holley, B. P., and we tender our thanks to the author for a copy of the work. It is a book of 900 pages, with 493 engravings, printed in fair type on good paper, and handsomely bound. It is filled from beginning to end with the most valuable and interesting facts pertaining to the subject of which it

exception of those which are taken from the pages of the SCIENTIFIC AMERICAN.

From the talent shown in the collection and compilation of facts, it is safe to infer that the discussions are also able; we shall notice these more at length when we have given them further examination.

Fatal Accident From Oxygen.

In December last, a Mr. Crowther, at Manchester, England, while engaged in preparing oxygen gas for the Drummond or oxy-hydrogen light, was instantly killed in his own dwelling by the explosion of his retort. His son and wife were also badly wounded. Mr. Crowther had often before prepared the gas, and it appeared at the inquest, that the explosion was

**WARNER'S REVOLVING WHEEL RAKE.**

The dotted lines show the position of the rake when folded up for moving from one field to another. By bearing on the handle at the side of the driver the rake can be elevated so as to clear obstacles of any nature. The proprietor says:—

"In offering his improved rake to the public he feels sure that he has the rake especially adapted to gathering hay, and one which will command the patronage of all hay growers after practical use.

"The labor of operating this rake consists in riding upon the cart, and resting the hand steadily upon the end of the lever. When it is to be revolved, bear a little upon the lever and at the same time spring the latch with the thumb upon the side of the lever, and the rake revolves, when the latch flies back and catches the rake from revolving the second time. In passing over obstructions the operator elevates the forward ends of the teeth by lifting up the lever; the rake may then be driven over; or, by bearing down upon the lever, the rear end of the teeth are elevated, when the rake may be backed up if desired.

This rake may be used by old men or boys, in fact, any one who is old enough to manage a horse and handle the lever. Patented through the Scientific American Patent Agency, Nov. 15, 1864.

treats. We have not space even for an enumeration of its contents, but select a few of the subdivisions as samples. Under the head of Hooped Guns there is first a description of the Armstrong gun: giving details of fabrication, breech-loading, rifling, charges, proof, cost, and endurance. Then follow the same details in relation to the Whitworth gun, the Blakely gun, the Parrott gun, and other hooped guns. The next section is devoted to solid wrought-iron guns, and contains descriptions of the Horsfall, the Stockton, the Brooklyn Navy Yard 12 in., and many other wrought-iron guns, with the particulars of their fabrication, charges, and endurance. Heavy shot at low velocities is discussed under seven heads, with full accounts of the various experiments bearing on the subject that have been made in England and America. In the same detailed and thorough manner are treated the subjects of small shot at high velocities, "The two systems combined," "Breaching masonry," "Resistance to elastic pressure," "The effects of vibration," "The effects of heat," "Elasticity and ductility," and, in short, all departments of the subject. The author asserts that the reports of experiments are derived almost exclusively from records and drawings in Government offices, with the

due to the adulteration of the manganese used, with soot or coal, and that when a small quantity of any such organic substance is present with chloride of potash a very explosive mixture is generated in the retort.

The practice of using oxygen gas for home pictures in the magic lantern has become quite common. We have never before heard of any serious injury resulting from its preparation, though we have more than once been cognizant of the unaccountable bursting of the elastic pipe which connects the retort and the wash bottle.

We believe that the magnesium light might be substituted for the oxy-hydrogen. The metal in the form of wire, for burning, is sold in London for 1½ cents a foot. At triple this price it would be as cheap as the oxy-hydrogen light for the majority of amateurs.

A good paste for fixing paper labels on tinned sheet iron may be obtained by preparing a paste from water, rye flour, and a small quantity of a solution of glue, to which add so much of Venice Turbith as to fit it for brushing over the labels, which will adhere closely to the tinned surface and will not be affected by rust.