

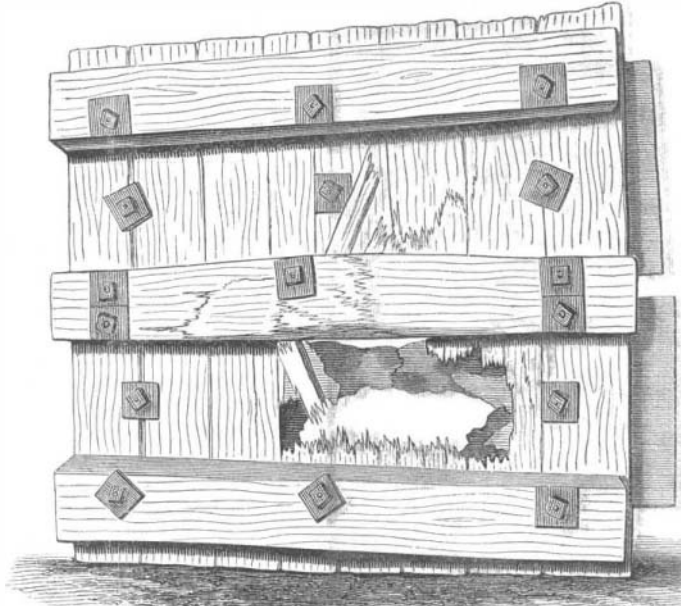
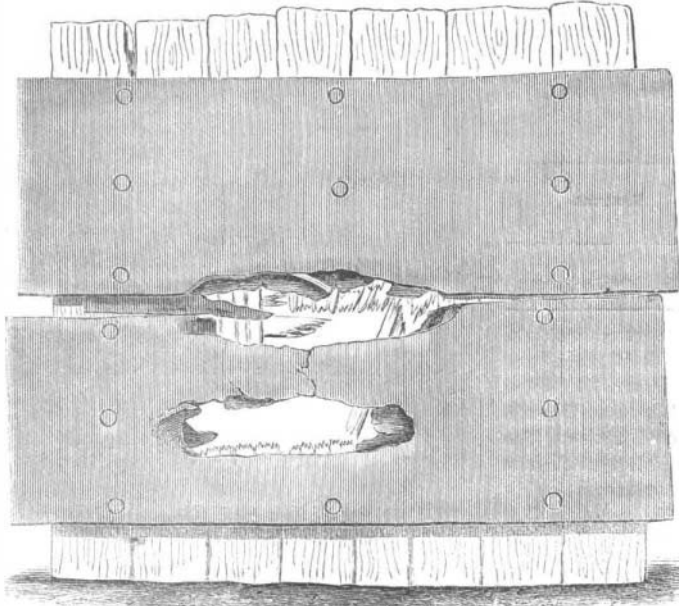
## PRACTICE AT IRON PLATE TARGET No. 15.

WITH RUBBER PLACED BETWEEN THE PLATES AND TIMBER.

PENCOTE BATTERY, Sept. 4, 1862.

This target was made of two thicknesses of half-inch boiler iron put on in four plates, backed by 1 inch rubber and 7 inches yellow pine, and 3 beams running lengthwise of the target. The rubber was placed between the plates and timber; all bolted together with eighteen 1½-inch bolts, and the target set up firmly against a bank of clay at an angle of 15°.

DIMENSIONS OF TARGET.—Iron plates 8 feet long, 6 feet 8 inches wide, and 1 inch thick; rubber 1 inch thick; timber 7 inches thick; beams 1 foot square.



Gun XI. inches, No. 214. Charges of cannon powder 1662. Projectiles, Cloverdale cast-iron solid shot. Primers friction tubes. Officer in charge, Lieut.-Commander Mitchell. Record by Carnigan. Hon. G. V. Fox, Assistant-Secretary of the Navy present.

No. from Gun.	No. of Charge.	Weight of Projectile.		Insertion	Recoil.	Distance to Target.	Time Fired.	REMARKS.
		lbs.	in.					
149	1	30	168	106	Tant Breeching	74	3 15	
150	2	30	169	106			3 31	

First shot struck the plates 3 feet 3 inches from the right hand edge, and 12 inches from the lower edge, tearing through the plates, rubber and timber, making a hole 3 feet 8 inches long, and mean width 8¾ inches. The shot passed off and penetrated the bank 11½ feet from the outer surface. Angle of shot after leaving the target was 9°. The plate is indented at the right edge of shot hole half an inch, at left-hand edge 1 inch, at top edge three-eighths of an inch, at lower edge 1 inch.

The second shot struck the plates on the crack between the plates, and 2½ feet from the right edge, tearing through the plates, rubber, timber, and a portion of the beam, making a hole 4 feet long and mean with 10 inches. This shot forced the lower plates from the upper ones 3½ inches on the left hand edge and over 1½ inches on the right-hand edge of the shot hole.

The shot passed off and penetrated the bank 15 feet. Angle of shot after leaving the target 9°.

The plate is indented on the right edge of the hole 1½ inches, on the left edge 1 inch; on the top edge ¾ of an inch, on the lower edge 1½ inches.

The plates are cracked from the lower edge of the shot hole No. 2 to the upper edge of shot hole No. 1.

The bolts appear to be in good condition on the face of the target, but it is impossible to ascertain if any are broken in the rear until the target is taken down.

Respectfully submitted,  
(Signed) W. MITCHELL,  
Lieut.-Commander, U.S.N.

## Vessels for Carrying Petroleum.

Our cotemporary, the *Pittsburgh Dispatch*, in alluding to a recent article on the above subject in our columns, in which the use of iron barrels was suggested, says:—"The *SCIENTIFIC AMERICAN*, generally well informed on subjects of this kind, recommends, in a recent issue, the adoption of certain safeguards, which have already been in use for some time, but which, from the apathy of those engaged in the business, have secured but a partial introduction into the traffic. A letter in the same number enters very fully into the defects of common barrels, when used for carrying petroleum, and the means of preventing leakage, but the editor suggests the propriety of manufacturing iron cylinders for the purpose, and also refers approvingly to a plan used by Young, an

of consulting those who had a practical knowledge of the subject, before passing any laws affecting the trade. Dr. Trench said that if the deputation could prove to the magistrates that wooden casks were sufficient to prevent either leakage or effluvia, they would be glad to save the trade the expense of providing casks of other material.

## New Chemical Agent in Warfare.

Chloride of nitrogen will, it is said, soon be utilized as an implement of war. Its employment would seem likely to put an end to all war. Mr. Isham Baggs, an English chemist, in announcing his discovery, proposes to carry up his composition in balloons, and drop it from the air in the midst of armies and fortresses. "The very mention of this

extensive manufacture of coal oil, in Scotland, for the same purpose. The plan thus recommended consists in coating the interior of each barrel with glue, a substance not affected like resin varnishes by oil, and the *SCIENTIFIC AMERICAN* states that it has not heard of the plan having been used in this country."

We are also informed by the *Dispatch* that two shops in Pittsburgh have commenced the manufacture of iron casks, but that these have not yet entered into common use. Respecting them it says:—"The iron barrels compare favorably in every respect with those of wood, the former weighing about thirty-four pounds and the latter forty-five. They are made of corrugated iron, of the ordinary capacity of oil barrels, and without 'bilge' or swell. Two kinds are used, one resembling the old powder cask, with annular corrugations, the other formed with longitudinal corrugations, about three-fourths of an inch in breadth. The heads are brazed in, and if desired a rough wooden jacket is hooped on outside of the barrel to preserve it from contusion."

An acquaintance who has been engaged for several years in manufacturing coal oil and refining petroleum, has informed us that the casks for carrying the refined article are coated with glue; but that the crude petroleum, if it contains water, will act upon the glue and soften it.

Recently a deputation of coopers waited upon the Health Committee of Liverpool (England) to express their disapprobation of a recommendation made by the Committee in favor of metal casks for the storage of petroleum, to the exclusion of wooden casks. The Chairman of the Cooper's Association asserted that wooden casks, when well made, were not inferior to those of iron. As coopers, they affirmed that wooden casks could be made quite tight, and they were prepared to furnish a cask filled with petroleum to convince the Health Committee of the fact. They were asked whether, even if the casks were made air-tight, the petroleum would not leak through the wood. Mr. Bennett, the Chairman, said this could not be, if the proper kind of wood was employed. The wood generally used was sometimes of indifferent quality. The deputation wished to impress upon the Health Committee the necessity

compound," he goes on to say, "as a proposed element in modern warfare, may possibly provoke a smile among chemists, who know that the most accomplished among their number would scarcely dare to experiment with in quantities larger than a grain of mustard seed, and even then at a respectful distance, and under guard at the moment of its detonation. And yet not one of those chemists will be bold enough to deny that with two or three chemically clean carboys of this terrible compound present in a city or fortress, however strong, the slightest cuttings of phosphorous or a single drop of olive oil coming in contact with it, would in one instant decide the fate of the place and its inhabitants." Mr. Baggs then proceeds to affirm that he has discovered a method of overcoming the contingent difficulties, and that he is able to manufacture this deadly material with perfect safety, and in any required quantity, and that it can be safely conveyed to its destination.

## Reaping the Reward of Faithfulness.

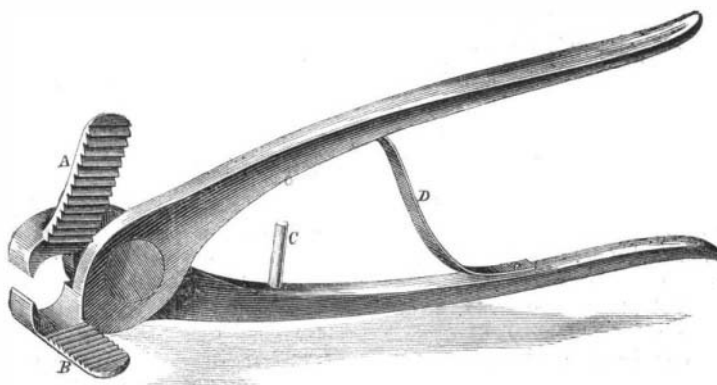
The British Government narrowly escaped having the bitter cup of its policy in American affairs pressed to its own lips a few weeks since. The screw steam-corvette *Pelorus* took fire in the Bay of Biscay, and at one time the flames got such headway that the boats were lowered to enable the crew to save themselves. A large vessel under full sail being seen about five miles distant, three guns were fired and rockets and bluelights burnt, but without taking any further notice of these signals of distress than by the discharge of a single gun, the strange vessel held on her course. This apparent inhumanity is explained by the British Admiralty on the supposition that she was a Union merchantman, who took the *Pelorus* to be a Confederate cruiser employing the ordinary devices to lure her into its clutches.

COTTON IN UTAH.—We learn from the *Farmer's Oracle* of Spring Lake Villa, Utah, that quite a good crop of cotton has been raised in that territory this year. Brigham Young has a cotton manufactory in operation, and another factory is soon to be erected at Springville. The quantity raised will average about five pounds for each inhabitant.

Improved Nail Clincher and Nippers.

By the aid of this instrument some parts of horse-shoeing are accomplished much more expeditiously than by the old methods. The object is to combine a pair of nippers and a clinching-iron in one tool, so that by the aid of them work may be done quicker and with more ease to the smith. On referring to the engraving it will be seen that the nippers are like all others as regards their particular duty, or office; to accomplish the clinching, however, the projections, A and B are fastened to one side of the nippers, the lower one being placed underneath the horse's hoof; the upper projection is brought down by the aid of the handles upon the point of the nail, and thus effectually clinched. There is a pin, C, inserted between the handles against which they strike when brought up, so that the sharp edges of the nippers are not in contact with each other and are thus preserved from injury. The object of the spring, D, is, of course, to force the handles apart; the serrated, or toothed faces of the projections prevent the tool from slipping when used. In regard to using the tool the inventor says "the nail is prepared just the same as if a hammer was to be used; in using the clinching projections, the left hand takes the same, or nearly the same position as in holding the common clinching iron, the left forefingers being under the clincher, while the thumb of the same hand is placed against the upright part of the clincher to steady it to its work."

This invention was patented through the Scientific American Patent Agency, on Nov. 3, 1863, by E. Warren, of Marshall, Mich. For further information address the inventor at that place. See advertisement in next number.



WARREN'S NAIL CLINCHER AND NIPPERS.

Recovering Gold in Photographers' Baths.

A correspondent of the *American Journal of Photography* asks the following questions:—

"I have on hand a lot of old toning solution, the gold in which is precipitated with proto-sulphate of iron; how am I to work it up into chloride of gold?"

"Of an ammonio-nitrate solution ( $\frac{1}{4}$  am.-nitrate) I wish to make a plain nitrate solution. Will you be so kind as to tell me the *modus operandi*?"

To which Professor Seely (the editor) gives the following answer:—

"Your precipitate from the toning bath is probably oxide of iron with a little gold in it. You can dissolve out the oxide of iron with sulphuric acid, and the gold will be left as a brown powder, which after washing in water may be converted into chloride in the usual way. The toning solution, before precipitation with iron, should be made acid with acetic or hydrochloric acid, in which case nothing

but the gold is precipitated. Sulphuret of potassium answers well for precipitating gold. In the last case the gold, after washing, should be heated to a red heat in order to drive off the sulphur, when it is ready for solution.

"By evaporating and fusing the ammonia nitrate, it will be converted into plain nitrate. But the operation is so troublesome that we would not recommend it to a person who is not skilled in chemical manipulation. Perhaps the best way for you is to precipitate as chloride, reduce to metal, and dissolve in nitric acid."

Brains.

Our cotemporary, the *Tribune*, in publishing the very able official report of Gen. Halleck, of the operations of our armies for the year 1863, allows its types to perpetrate a very melancholy joke upon the General, wherein he speaks of the cumbrous "supply trains" that follow our forces. The types make him say—"nevertheless our brains have been very considerably reduced within the past year."

Gen. Halleck, while commanding the Mississippi Department, gained the soubriquet of "Old Brains," and it is barely possible that he has reduced the quantity somewhat, though we confess after reading this voluminous report that we cannot see it.

**SUBSTITUTES FOR COTTON.**—The Commissioners appointed by the Department of Agriculture for making investigations to test the practicability of cultivating and preparing flax and hemp as a substitute for cotton, will hold their adjourned meeting on the 24th of February. In the meantime all persons anxious to develop this subject are requested to forward samples of hemp and flax in different stages of preparation of the fibres and fabrics prepared by them, accompanied by statements of the various processes used, and the cost of production in each case; also descriptions of the kinds and cost of machinery used, where made, &c., together with any and all information which may be useful to the Commission.

A CURIOUS accident occurred last month on the Central Railroad, near Oriskany, N. Y. The boiler of the locomotive exploded while the train (a freight) was under full headway. It was thrown some fifty rods from the track into an adjacent field, destroying fences, &c., in its course. The fragments of the locomotive flew in every direction, severely wounding the fireman, conductor, and one or two others. The accident is considered one of the most remarkable on record.

Rebels and Repeating Rifles.

A soldier-correspondent who writes us from Virginia some very friendly remarks concerning the value of the *SCIENTIFIC AMERICAN* to soldiers, relates also the following anecdote concerning the Spencer rifle; the rebels have a wholesome awe of this weapon as will be seen from the account appended:—

"After the battle at Gettysburgh whilst our cavalry were pursuing the rebels, our regiment was employed as skirmishers; some of our boys got into a mill, the rebels holding a stone-wall opposite; these hearing our guns go off, would rise up thinking they would find us unloaded, but would fall back carrying rather more lead than was agreeable. The 'Johnnies' couldn't stand this long and retired. Shortly after this we took a captured officer across this part of the field to the rear, when he saw his men lying there he began to complain bitterly against our barbarity; he was asked to explain, when he pointed to his dead saying: 'almost all are shot through the head'—implying that they had been murdered after surrendering; but when he was shown one of our rifles he only wondered that more were not shot."

One of our rebel prisoners relates the following:—'I was under good cover, but exposing myself was fired upon; thinking I had drawn their fire I stepped out when another ball just missed me; I thought perhaps that they had a double-battered gun, and I had him sure. I stepped out again when another ball grazed me; then I thought there must be two in front of me. I then stepped entirely

from under my cover, determined to have my chance for a shot, and was wounded by a fourth shot. While I was lying there I heard three more shots in rapid succession from the same gun, when our boys fell back and yours came up and sent me prisoner to the rear,' said he 'there's no use fighting against such guns.' It took our boys but a short time to learn to use them. They played this ruse upon the rebels quite successfully: when they came up where they knew the rebel line of skirmishers were within good shot they would fire once at random, when Mr. Reb rose up in sight he would get another shot at something he could see and feel.

One day as our line of skirmishers were advancing one of the Johnnies yelled out—"hello, Yanks, have you got them d—d guns loaded to the muzzle again;" whilst the cavalry was picketing along Robertson's river skirmishing was frequent along the line, but when our regiment took its turn we exchanged but a few shots with them when they offered the following proposition:—"Say there, if you'ns won't shoot we'ns won't shoot," and peace existed along the lines as long as our regiment remained."

**FLAX COTTON.**—The *Cleveland (Ohio) Herald* states that B. O. Warner has built a mill at Toledo, for preparing flax cotton at the rate of 2,000 pounds per day. It is prepared for an Eastern Company engaged in the manufacture of satinets.

It is stated in a communication upon "Rifled Ordnance" which appeared in a recent issue of the *SCIENTIFIC AMERICAN* that "for guns exceeding 4½ inches caliber from  $\frac{1}{2}$  to  $1\frac{3}{4}$  diameter is preferred, &c." the line should read "from  $1\frac{1}{2}$  to  $1\frac{3}{4}$  diameter," &c.

A correspondent sends us some remarks about rolled and hammered bayonets. The letter is unsigned; we cannot give attention to anonymous communications upon any subject.

PUNCH's joke about brushing hair by machinery, which looks like no joke to the patronizer, is really a stern fact, as such a machine is in operation at a famous hair-dresser's in London.

THE following is deceptively promulgated under the head of zoological information:—The black tapir is found in many districts of Summatra, but the red tapir is found chiefly in the District of Columbia."

NAPOLEON said that "bayonets throb." Few thinkers have so much keenness, point and penetration as they.

Formation of the Fatty Matter in Olives.

M. de Luca has reported to the Academy of Sciences at Paris the results of his elaborate researches on this subject. From the figures given in his table of observations, ranging from June to December, it appears that the weight of the olive increases with the progress of vegetation until the month of November; but that the stone is the first to be developed, the growth of which takes place in the early part of vegetation, during the months of July and August, after which it remains stationary; there being, in fact, in successive months no sensible variation of its weight. The pulp on the contrary, increases in weight continually until the complete maturity of the fruit. The quantity of water found in olives diminishes progressively at their maturity. Thus it is about 60 or 70 per cent in the first phases of vegetation, while it is only about 25 per cent. at the last period of the growth and maturity of the fruit. The sulphuret of carbon takes from olives several substances of a different nature; among which are coloring matters, especially chlorophyll, which gradually diminishes as the fruit approaches maturity. The fatty matter, on the contrary, which is found only in small quantity at the beginning of vegetation, increases as the plant grows, and is at its maximum when the olives are ripe and have completely lost all trace of their greenish tint. It is also remarkable that when the stone ceases to increase in weight the fatty matter in the fruit accumulates in greater proportion.

The Turko-American Bath.

The patient submits to an air bath in an apartment heated to 100° Fah., followed by another at 146° Fah., remaining in these hot atmospheres for half an hour or so, until profuse perspiration is induced. The seven millions of pores are thus made to open their portals, bringing the effete matter of the system to the surface of the skin; thence it is removed by soap and brush, in the hands of a vigorous assistant; closing with a warm water shower and a comfortable drying off between clean sheets and soft blankets. Nothing can be more luxurious than this process, while its medical uses are considered extensive and important. The Turko-American bath has been inaugurated by Dr. Sæphard, at the Brooklyn Water Cure, 63 Columbia street.

**Improved Hitching Bolt.**

The old idea that it is impossible to remove a horse from fire when once fascinated by it, may have had its origin in the unwillingness of some responsible individual to undertake the rescue of beasts so situated, and so ever afterward it became a proverb; doubtless like many others, without foundation. Of course, horses cannot get away when they are tied, and by the time the halter is consumed the animal is in no condition to leave. The invention herewith illustrated is designed to obviate this evil, and also others which attend unhitching horses, such as those which arise from entering the stable of vicious animals, and in short, to provide a secure and safe attachment to which horses may be tethered, without liability of accidental detachment. These objects are all obtained in the bolt herewith illustrated; the engraving explains itself. The invention is merely a stout bolt, A, provided with a spring in the case, B; these bolts are all connected with a handle, C, by a wire which runs through the groove, D; when the bolt is drawn back the halter may be slipped over it, and is then held in place when the bolt flies back to its seat as shown in the engraving. If it is necessary, the handle, C, may be kept extended. This is accomplished by the spring-catch, E; it being made in two parts which embrace the rod of the handle, C; when the catch is pulled open the rod is drawn out until the recess, F, comes outside of the case, G; the catch then falls into it, holds all the bolts open and the horses are released. Any number of bolts may be fastened thus and worked by one hand, or each bolt can at any time be worked separately by pulling on the knob, H; thus avoiding the necessity for going to the principal handle, which is perhaps situated at some distance.

The patent for this invention was procured through the Scientific American Patent Agency, Oct. 27, 1863. For further information address Julius Hurxthal, 23 William street, N. Y.

**Explosion of Naphtha.**

At an inquest lately held in England, a grocer testified that while he was pouring coal oil from a barrel into another vessel, a lighted candle being within three feet, he saw a small blue flame run along the outside of the barrel to the bung hole. Of what followed he was ignorant. But it appears that a terrible explosion ensued, for the grocer was pitched up into the street, insensible; his house was set on fire, the upper apartments quickly filled with a dense black smoke, by which three of his children were suffocated, while his wife and three other little ones barely escaped with their lives. This explosive stuff was found to be a very light coal oil, or naphtha, the vapor from which is highly explosive.

**Loss of an Iron-clad.**

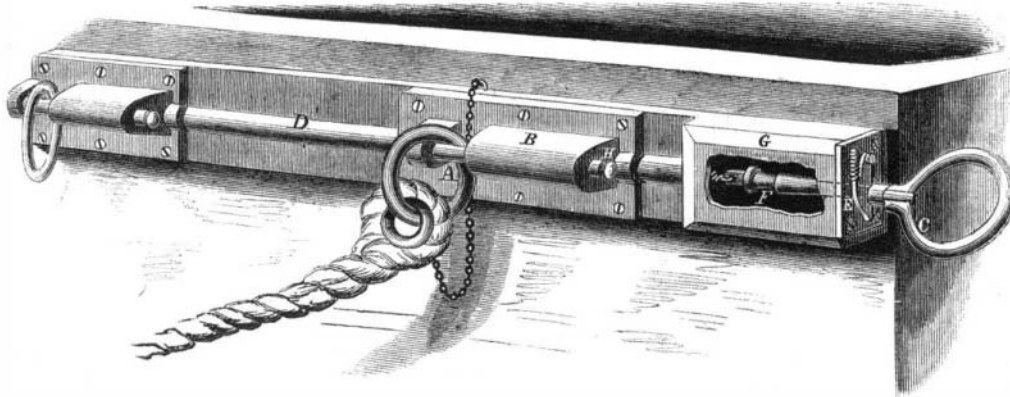
The *Weehawken* recently went down at her anchorage in Charleston Harbor. This was caused by great neglect on the part of those in charge of the battery. The *Weehawken* was very low in the water, so much so that her deck was submerged continually by the seas; during a severe gale the forward hatch was left off the hatchway, and the water poured down in a continuous stream, without those on board being aware of the fact until it was too late. There were some thirty persons, engineers and others, lost in the *Weehawken*; she was a monitor battery, and quite new. The accident is very much regretted; it was one that might have been avoided by proper care, as all the other monitors in the vicinity rode out the gale unharmed.

THE 22-ton gun of Sir William Armstrong requires a crew of twenty men to handle it; the 20-ton gun in the monitors can be worked by three, or at most four men—a slight difference!

**Nitrous Oxide.**

Concerning this gas, over which there is now so much discussion, the *American Druggist and Chemist's Circular* says:—"We have noticed the prominence which has lately been given by dentists throughout the country, and by a number of 'Professors,' to the inhalation of nitrous oxide gas as an excitant and an anesthetic. From what we have seen of the apparatus and materials employed by parties here, it is the

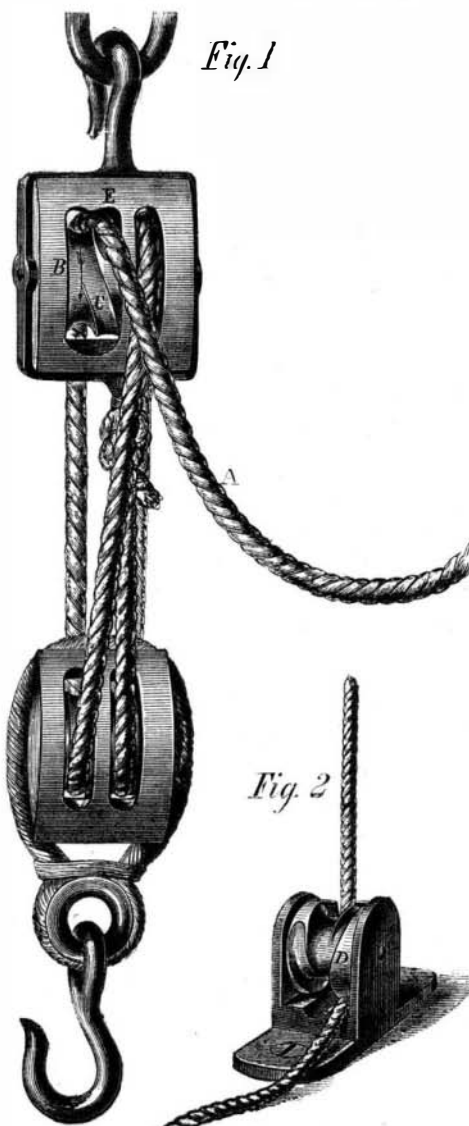
as two with the ordinary block and fall, as there is no duty or work required but simply that of hauling or pulling on the rope. It is well known that in the act of hoisting weights by the means of tackle, it requires much exertion to prevent the weight from falling back in the interval of hoisting; this labor is dispensed with in the pulley block shown in the engraving. When the workman hauls on the rope, A, the weight is hoisted as with all other pulley

**KLOENNE'S HITCHING BOLT.**

old laughing-gas of Sir Humphrey Davy again galvanized into life and notice; and since, in the hands of dentists, the effects, as now described, are so much at variance with what is generally stated about them in the text-books, we must conclude that the gas is either more thoroughly purified and free from noxious admixtures, or that it is diluted with air or some other gaseous body, and thus divested of some of the unpleasant effects of the ordinary nitrous oxide."

**PALMER'S PULLEY BLOCK.**

The engraving published herewith represents an

*Fig. 1**Fig. 2*

ingenious method for taking up the slack of a "fall," or rope, when attached to a block or pulley. By this arrangement one man can do as much work

as two with the ordinary block and fall, as there is no duty or work required but simply that of hauling or pulling on the rope. It is well known that in the act of hoisting weights by the means of tackle, it requires much exertion to prevent the weight from falling back in the interval of hoisting; this labor is dispensed with in the pulley block shown in the engraving. When the workman hauls on the rope, A, the weight is hoisted as with all other pulley blocks; instead, however, of taking a turn around the nearest post to keep the "slack," the peculiar construction of one wheel, B, in the block, takes all the strain itself and leaves the workman fresh, or free, from the exhausting labor of holding back against the tendency of the load to drop. It will be seen that this is accomplished by simply cutting a side groove, C, beginning at the same depth as the true groove of

the pulley (shown by the arrow in Fig. 1) and running out to nothing, ending in a flat surface or circumference as at D in Fig. 2. When, therefore, the slack is to be taken in the workman merely diverts the fall, A, a little to one side, when it takes the false groove, C, runs up in it and jams between the block and wheel; as at E, in Fig. 1. In Fig. 2 the same operation is shown and this variety in the form of the pulley may be substituted for the ordinary snatch-block, or for the cleat, so much used on shipboard. This device is a very convenient one for the purpose mentioned previously, as every practical man can readily see; it dispenses with labor, and completely secures the ends desired. The block and fall, with load attached, can be left suspended for any length of time with this arrangement. The pulley blocks, in other respects, are not peculiar.

This invention was patented on Nov. 1, 1859, by Isaac E. Palmer, of Montville, Conn. Patent reissued through the Scientific American Patent Agency, on Sept. 8, 1863.

The patent is for sale on very favorable terms, as it is out of the patentee's usual business. For further information address Isaac E. Palmer, care of H. F. Palmer, No. 28 Warren street, N. Y.

**Quite Novel.**

Army correspondents make a great many funny mistakes when they attempt to write about military or mechanical subjects; we think the following incident, however (which the correspondent who sends it says is "a novel effect") is the most startling and surprising one that ever came under our notice. Mr. Whitworth may learn something, it seems, even from an army correspondent. We quote:—

"After a few discharges the gun was found to have lengthened two inches. This was caused by the immense strain upon the piece in projecting the ball; the resistance offered by the rifling causing the immense mass of metal to draw out as if it had been a piece of iron wire in process of manufacture."

**Copper-coated Boiler Plates.**

An English boiler-maker has taken out a patent to protect boiler plates from damage by furrowing or corrosion. This occurs chiefly in the neighborhood of the seams and rivet holes; these parts are therefore covered with copper, either in thin sheets or by deposit, for the purpose set forth. This remedy is worse than the disease it is intended to cure, the contact of the two metals inducing galvanic action which will deteriorate the plates more rapidly than furrowing.

Gen. Burnside, by a rapid flank march from Knoxville upon Cumberland Gap, cut off the retreat of the rebel garrison which was thus compelled to surrender. His infantry made a forced march of sixty miles in fifty-two hours. His defence of Knoxville against the besieging forces of the rebel Longstreet, is one of the most heroic achievements of the war.