



### Corrugated Plates for Ships.

MESSRS. EDITORS:—Since reading some particulars about steel-clad ships in the SCIENTIFIC AMERICAN, it has occurred to me that ships could be rendered shot-proof by using one half the thickness of steel with which the French and English ships are clad, in the following manner, viz., by corrugating or fluting the outside of the steel, or giving it an undulating surface with elevations and depressions like an old-fashioned wooden wash-board. The steel could easily be made so by heating and being crimped by a steam hammer. The philosophy of this arrangement would be simply to destroy the effect of the ball by giving it a lateral push or glancing the ball. I do believe that not one ball in ten would strike directly in the trough. Place them so as to run lengthwise on the ship near the water, so as not to prevent the speed of the ship, and have the water-line in a perpendicular position.

For example, if a person is falling from the roof of a house, give him a push at right angles with the perpendicular line of descent, and you break the force of the fall. This fact is well known to you, and probably to many. All I am after, then, is to push the ball sidewise. I should like to have the SCIENTIFIC AMERICAN talk a little on the subject. The idea may be old to you.

Worcester, Mass., May 16, 1861.

J. C. STODDARD.

[As our correspondent supposes, the idea is not new. It has been proposed by Commander Dahlgren and somewhat extensively discussed, but the subject is by no means exhausted. On the contrary, it forms one of the fairest fields for invention and experiment that is now open.—Eps.]

### American-made Fire-brick.

MESSRS. EDITORS:—Reading in your issue of the 11th inst. an article on "Fire-clay Manufactures," brought to my mind that, in January last, I saw a notice in your paper of a patent issued in this country in the name of A. L. Boisson, of Lyons, France (obtained through your Agency), for an improvement in the preparation of the clay and the sand, for making a very superior quality of fire-brick, and also for a new plan of a kiln for burning all kinds of fire-clay articles. Such is the perfection of the kiln that it will save from 40 to 50 per cent in the cost of fuel.

Both of the above improvements were put into practice, last winter, at the works of Messrs. Palmer, Newton & Co., fire-brick manufacturers, Albany, N. Y., and so satisfactory were the results of the experiments that the firm purchased a right for the city of Albany.

Some of the bricks were built in the fire bridge (alternately with others) of a puddling furnace. After the furnace had been run the usual length of time, and had stopped for repair, the ordinary kind of fire-bricks were melted down, while the patent bricks were only colored, and retained their full original shape; and it was remarked by the workmen that had the fire bridge been built entirely of the patent bricks it would have lasted at least thrice as long as usual.

These bricks will be invaluable in gas works now that clay retorts are coming into general use, and as clay retorts will last from two and a half to three years without rebuilding, the furnaces must be made to endure that long. These bricks are invaluable on that account, and will supply the requirements. Gas engineers and owners of puddling furnaces will no doubt appreciate their value.

Albany, N. Y., May 15, 1861.

### Patriotic Contributions.

Since our publication of the patriotic contributions to the support of the government, we have received several communications informing us of omissions. For instance, A. Homer Trego, of Lambertville, N. J., says that that town contains about 500 voters, and they have 160 volunteers now at the seat of war. All the officers and some of the privates have been presented with revolvers. All were furnished with a full supply of under-clothing, rubber blankets, vestments, &c. About \$100 per month is subscribed for the sup-

port of the families that are left. Two other companies are organized and under drill, besides the lads from 16 to 18, numbering about 30, who are under good drill. The following letters, being short, we give as a fair sample of the lot:—

MESSRS. EDITORS.—In the SCIENTIFIC AMERICAN of May 25, 1861, on page 333, you have published a list of "Patriotic Contributions," &c. In that list are some mistakes which, for history's sake, I hope you will correct.

Yoursay—"New Jersey (State) \$1,000,000." It should be \$2,000,000, as per resolution of extra session of the Legislature just concluded.

Again—"Burlington, Vt., \$3,000." It should be \$13,000, as, to my certain knowledge, one large manufacturing company there—the Messrs. Harding—gave \$10,000.

Then, again, an omission. This city has voted \$10,000, and obtained leave of the Legislature to issue bonds to that amount. Rahway, Elizabeth, and other towns also have voted large sums.

A CONSTANT READER.  
Trenton, N. J., May 16, 1861.

MESSRS. EDITORS.—I noticed in the list of "Patriotic Contributions" published in your paper, that Malden, Mass., has only contributed \$2,000. That is a mistake; a company has been formed and \$4,500 have been raised to equip them. The town has also voted \$10,000 for the support of the families of those who enlist, and if more is wanted they will raise more. I wish the town done justice, and so I pen you this note. If necessary, Malden can raise a regiment and put them into the field in a few days. I, for one, should my country need me, will go and stand by the "Stars and Stripes," as long as I live.

P. S. Malden furnished men for the Revolutionary War, and she can furnish men for this war.

### LETTERS FROM THE SOUTH.

PETERSBURG, Va., May 6, 1861.

MESSRS. EDITORS:—Yours of the 27th ult., covering \$25, together with the Letters Patent of my Self-acting Railroad, was duly received, for which I must say I am obliged to you.

You say we of the Middle States are beside ourselves. For what? For contending for our constitutional rights, and quitting your corrupt, rotten and rascally government, governed by a mean, vile abolitionist, who tramples on the constitution as he does the dirt he walks upon. Yet you say you are all for the "Stars and Stripes." Well, we of the South are just as unanimous against the "Stars and Stripes" as you abolitionists are for them, and we never intend to live under your "Stars and Stripes" again. You never can conquer or subdue us. We will fight—every man, woman and child of us—as long as we live, and will teach our children, from generation to generation, to hate and fight a Yankee worse than hell and the devil. I tell you our negroes will fight you all nearly as unanimous as their masters; for they, too, know the meanest masters in the South are Yankees who have settled among us. You may think these statements not correct, but when your mean, low, mercenary soldiers invade the South you will then see what I have written you is true.

But the "Stars and Stripes" to a Yankee is every and all things. Yes, so you say; but your real object is to keep us in the future as we have been in the past—make the South hewers of wood and drawers of water to the Yankee States. That is what you want and mean by the "Stars and Stripes." When did the South ever infringe upon the rights of the North? Never, in the whole history of the government. But the North never has treated the South as her equals. We must pay cod-fishing bounties. The coasting trade must be done in Yankee ships. We must pay high protective tariffs. What are we told as to the territories? "Ah, yes, you people of the South can't emigrate to them as equals with a Yankee." And, now, what is old Abe Lincoln doing? Why, violating the constitution with perfect impunity. The constitution expressly confides the war making to Congress, and it must be against a foreign State. And "Abe" says a State can't secede. To raise and support armies is the special prerogative of Congress. No preference shall be given by any regulation of commerce or revenue to the ports of one State over that of another—so says the constitution. Yet "old Abe" blockades the ports of nine States. The constitution requires the President to take care of the public property. What did "Abe" do? What has he done at Harper's Ferry and at the Navy Yard in this State? But it is needless to say more. I could give a dozen plain violations of the constitution by that old usurper in the last two months. Yet your howling, hypocritical, fanatical set of blue-bellied abolitionists still proclaim for the "Stars and Stripes." Well, you can have the "Stars and Stripes;" WE NEVER WILL, CERTAIN. You never will subdue us; we will fight you from generation to generation, and, as Hannibal of old has done, will swear our children to hate and fight a Yankee as the greatest duty he can perform to his God and country. Yes, sir; we will teach it from the cradle to the grave as the most sacred duty in life.

Yes, I expect I am one of the earliest subscribers you had in western North Carolina to the SCIENTIFIC AMERICAN, which is more than 10 years ago, and have induced hundreds to subscribe for it, little thinking I was patronizing an abolitionist, and one who would seek the first opportunity to imbrue his hands in my blood. Well, sir, as this is the case, come on; let me know what regiment and company you are in and I will meet you in battle, and if I don't make one abolitionist bite the dust then you may have my head. You will find when you invade our soil that you Yankees will have to fight perfect devils, for you have no idea what hatred universally pervades all and every one in the South. All ages, sex, colors and races hate a damned blue-bellied Yankee worse than hell. But you think you can whip us! Well, come on; you will get hell put to you all. With all the hate, scorn and contempt man can feel, I have for a Yankee abolitionist,

J. C. WHITSON.

A short time previous to the receipt of this letter our friend Whitson congratulated us upon our success in his behalf, and even now thanks us for our fidelity in returning money due to him. We submit, however, that he is now acting in an underhand manner toward us in spite of our good offices to him.

He wants to find out where we are going to fight, so that he may have a sly pop at us, perchance, from behind a tree or stone wall. A fair and open combatant will not conceal his own fighting ground under such circumstances. We have no murderous designs on our friend. We will state, however, that all our fighting will be done in the army of the constitution and the Union—a Union formed by Washington, Jefferson, Madison, and sustained by Jackson, Clay, Polk, Webster, and a host of other national men—dead and living. We want no better government, and if enemies of our peace and happiness—violent men North and South—have worked together to impair its integrity, they have found no sympathy from us. We are content to change our government and our institutions only in a legal and peaceful manner, and regard all violations and violators as enemies of social order and stable government.

### LOOK OUT! LOOK OUT!!

FOR THE SCIENTIFIC AMERICAN, published in New York, and edited by MUNN & CO. It is against the South, and Southern Mechanics and Artisans ought to drop the scurrilous sheet. Rebels, indeed! I wonder if rebels are notable to get patents as well as Black Republicans. Stop that paper, ye Southern men.  
MAY 3 34\* A SUBSCRIBER FOR TEN YEARS.

MESSRS. EDITORS.—The last number of your paper, bearing date May 4, 1861, was duly received, in which I find you to have gone stark mad! I also inclose you an advertisement for which I paid \$1 (and that willingly, too), to show to those of the South the character of your paper. Your paper treats altogether on scientific subjects, and it was decidedly going out of your way to publish the articles contained in your last issue. I shall, if I am spared (although a rebel in your eyes), look out sharply for your paper amongst us, and do all I can to blast your character and reputation as unbiassed men. I also send you the rebel President's message, which I hope you will peruse (if not too insane), and come a little to your senses. That message covers the whole ground of argument, and is not to be refuted. The several States, in 1787, by each of their sovereign powers, dedicated themselves to each other and made the one Old United States, but, at the time, reserved their sovereignty to retake to themselves the control and management of their individual States provided their independent rights were infringed. Have not the Southern States, therefore, a right to do as they like with their own? Do you think you can make us remain and support your rotten government, after the bitter hate you have all shown us? No! never, if you beat us. Can you thus make us do what we do not want to do? Never!! If your free States have the power to pass their Personal Liberty Bills and Laws, we then have a right to leave such an unjust and overbearing set of men; but argument is futile in this war of fanaticism.

Respectfully,  
WM. S. ALDERSON.

Mobile, Ala., May 4, 1861.

P. S. You will therefore stop my paper from this time forth, for evermore. Amen.

COURTLAND, Ala., May 9, 1861.

MESSRS. EDITORS:—You will please stop my SCIENTIFIC AMERICAN. I want no communication in any shape with abolitionists. I will never patronize anyone that will sustain Lincoln and his blood-thirsty, Heaven-daring crew. I, like many others, was strong for the Union until Lincoln made known his fiendish course by calling out 75,000 men. He is getting a military power at his control that will, before twelve months, make many quail and tremble that are now almost willing to bend the knee and wipe the dust off his boots. He'll give you a standing army, to the sorrow of many a Northern heart. With due respect,

Our correspondent having failed to give us his name, we are unable to stop his paper. If, however, he wishes us to cease only on account of our supposed abolition sentiments, we shall doubtless be able to continue our intercourse with him for some time to come. It is a matter of surprise to us that many Southern people cannot tolerate a supporter of the Federal government without denouncing him as an abolitionist. Knowing this charge to be false, not only with reference to ourselves, but also in reference to our people generally, we might be content to pay no attention to it; but the charge is persistently made to influence the whole population of the South against the North in a most unworthy manner, and deserves to be rebuked. Even a New Orleans paper pronounced General Butler an African, leaving out of view the fact that he was the Breckinridge candidate for Governor of Massachusetts at the last election, and that, while in Maryland, he offered to Governor Hicks the soldiers under his command to suppress servile insurrection. It is a bad cause that must rely upon such stuff to maintain it. Our friend seems to commiserate us on the prospect of our being subjected to a military power supported by a standing army. We apprehend that, at the worst, we shall be as free as himself in this respect. Let come what may, hereafter, the United States must maintain a standing army. This Southern revolution will render it absolutely necessary. The government must have more ready machinery to protect itself against danger by land and sea.

## Letter from a Southern Unionist.

MESSEURS. EDITORS:—In your excellent and temperate political article in No. 19 of the present volume of the SCIENTIFIC AMERICAN, on the "Reason for Secession," permit me to say that you have (perhaps, however, without the knowledge of it) omitted the chief reason, or, at least, the supposed or imaginary one, viz.: that the consequence of Lincoln's election would be, from his well-known aversion to slavery, total ruin to the slave owner, and the final emancipation of all the Southern slaves, which, to Southern notions, would be equal to letting loose a host of wild beasts or savages among them. This is the main cause of the Southern hostility to the Federal government, and were the mass of the people satisfied that such would not be the case, many that are now in military ranks would be at home.

There are still, however, many here who take no part in the matter, and will not unless compelled—those who are not slave owners, and, from their present enormous prices, perhaps never will be able to own any; also those who are opposed to aristocracy, who, from their wealth, monopolize every negro and rich piece of land, leaving the poor man but a sorry chance to make a living. Many are also uninterested because they think the rich urge it on the humbler classes to do their fighting and help them to support the slave system while they themselves luxuriate in idleness at home. It is believed that if the matter had been left to the unbiased votes of the people at large, there never would have been secession; the vote was by no means unanimous. Many that did vote were urged on to it to prevent the liberation of the slaves before alluded to, and here, though a Unionist, I would say, from an intimate acquaintance with the whole matter, and a residence both North and South, it would never do to set slaves totally free among the people here, if, indeed, that ever was the intention of the Lincoln administration. It is only by careful watching and the strictest laws that they can now be kept in order; and, to be candid, much of the labor required in this country can only be performed by the negroes. For instance, what white man can work in swamps or cultivate rice? however many would be glad of some change in the system.

In Southern eyes, the desertion of Fort Moultrie and allowing the secessionists to construct fortifications right under the guns of Fort Sumter, was and is looked upon as an evidence of the total weakness and want of courage in the Federal government, and the victories and advantages generally gained by the South is looked upon as an instance of special Divine favor and approbation of the Southern movement. However, the wicked prosper more for a time than the righteous. Let the Federal government be cautious; the attack on Washington is only a ruse to attract the Federal troops to one spot. Let the government make one good example, and show the South that Northerners are not the weak and bombastic cowards they are here taken to be—the fleet off Fort Sumter favoring this notion. All the remarks in Northern papers, yours among the rest, are here set down as fudge, and written for effect. S. C.

P. S.—For obvious reasons, I must withhold my name, but am a subscriber to your paper. I may add that the South implicitly believes that King Cotton will finally carry it triumphant through all difficulties. Camden, S. C., May 17, 1861.

## St. Louis Arsenal.

MESSEURS. EDITORS:—I know you are disposed to admit nothing into the columns of your paper but facts, as near as you can get them, in relation to the unfortunate troubles which are now afflicting our common country.

In this connection, I would beg to call your attention to the letter copied into your paper a short time ago, in relation to the removal of arms from our arsenal. There are no material facts in the communication except the removal of the arms, peaceably and without the least anticipation of trouble from any quarter. The experiences of the last few days will show how perfectly ridiculous it was to anticipate trouble from that quarter, when the whole camp was taken possession of by the United States forces. If Captain Stokes experienced the anxiety he says he did, it shows him to be a very scary man. Having no motive in writing this except the dissemination of truth for your history,

I remain, yours, for the whole Union, R. C.  
St. Louis, May 15, 1861.

STAIN FOR TWISTED GUN BARRELS.—The following is the usual recipe for staining twisted barrels:—Take of tincture of sesquichloride of iron half an ounce, corrosive sublimate one drachm, sulphate of copper half a drachm, nitric acid one drachm to one drachm and a half, spirit of wine six drachms, water eight ounces. Dissolve the corrosive sublimate in the spirit of wine, then add the solution to the other ingredients, and let the whole stand for a month or six weeks, when it will be fit for use. The barrels are first cleaned carefully with lime, and this being removed, the browning mixture is laid on with a sponge five or six times a day, till the color is dark enough for the fancy. Once or twice a day a scratch-brush is used to remove the rough oxyd and allow the acid to get a deeper bite. When it is considered that enough has been done, boiling water is poured over the barrels for several minutes, and, while hot, they are rubbed with flannels and finished with a leather and a little bees-wax and turpentine.

## Remarkable Locomotive Explosion.

The Chicago *Tribune* thus describes the recent explosion of a locomotive on the Michigan Southern Railroad:—

The train was due in this city at 8 P. M., and it consisted of two passenger cars and a baggage car drawn by the fine Manchester built engine, *Charles Butler*, No. 67. Conductor Curtis was in charge; George Nair, engineer. As the train was nearing Ainsworth station, the intersection with the Illinois Central Railroad, 11 miles from this city, the engineer sounded his whistle to break up, and the breaks were applied, when, just as the speed was checked, the boiler exploded with fearful violence, tearing away the "crown sheet" downward through the firebox.

The effects of the explosion were terrific. The heavy machine, weighing 23 tons, by the downward and lifting force, leaped bodily from the track into the air, turned a summersault, and landed reversed and bottom side up a distance of 354 feet from where the accident took place.

This seems incredible, but is shown by actual measurement. The train was running at the time at about 15 miles an hour, but had been running at high speed. There were on the engine the engineer, Mr. Nair, his fireman, Charles Stelp, and the track foreman, named W. Anderson—the latter sitting on the cab seat. Mr. Nair was thrown into the air and to one side, landing near the fence senseless, but not dangerously though severely injured. None of his limbs were broken.

The other two men—Stelp and Anderson—were probably instantly killed, the former being frightfully scalded, his clothing being torn from his person. Both bodies were taken from the ruins of the tender and baggage car. No other person in the train was injured, though several were buried in the sudden shock and halt of the train. The track was torn up for a distance of several rods.

The track of the Pittsburgh, Fort Wayne and Chicago, at this point, runs for some distance closely parallel to the Michigan Southern track; and on the former, a passenger train due here at the same hour was approaching the city. The passengers in each were watching the other, when suddenly the persons on the Pittsburg train saw the engine leap into the air, with the crash and ruin that followed. The suddenness and appearance of the disaster is described by one of the passengers as to have produced, at first, the impression that, by some fiendish malice, the train was blown up by powder placed beneath the track.

## Massachusetts Manufacturing Dividends.

We extract the following interesting business items for the Boston *Commercial Bulletin* of the 18th ult.:—

The Lowell Machine Shop has declared an annual dividend of eight per cent, payable 27th inst. Commenced in 1855—make cotton machinery, locomotives, &c.—capital of \$600,000, all paid in—liabilities, March 21st, \$223,686.00.

The James Steam Mills, Newburyport, have declared a semi-annual dividend of five per cent, payable 20th inst. Commenced in 1842—sheetings and shirtings—capital \$250,000.

The Globe Steam Mills, Newburyport, has declared a semi-annual dividend of three per cent, payable from 13th inst. Commenced in 1844—make jeans, flannels, printing cloths, &c.—capital, \$200,000. At the annual meeting of the stockholders of the corporation, 13th inst., Mr. Alexander D. Brown was elected treasurer in the place of John Porter, Esq., who resigned after a service of 17 years. He leaves a good successor in Mr. Brown, who has been employed at the Bartlett and Globe Mills for 22 years.

The Bartlett Steam Mills, Newburyport, will hold their annual meeting next Monday, the 20th.

The Fibrella Felting Company, organized under the general laws, have issued their legal notice, from which we condense the following:—This corporation is formed to carry on the business of manufacturing flax, hemp, jute, China grass, silk, wool, cotton, and like fibrous substances in the various forms of manufacture necessary for yarns, cloth and felt, as well as the bleaching and coloring the same. The capital stock is \$10,000, which has been paid in and has been expended in the purchase of machinery, patent rights, &c., for carrying on the business. The par value of each share is \$100, and the business is carried on in Winchester, Middlesex county. Stephen M. Allen is president, Geo. L. Fall is treasurer; and they, with S. P. White, are the directors.

The Suffolk Lead Works, South Boston, commenced in 1844—make sugar of lead, chemicals, &c. Their capital is \$100,000 paid in, and their total liabilities on 30th ult. were \$61,340.

## New Gun Boats.

The United States Navy Department has invited proposals for building the machines of several screw gun boats. The engines of each are to be horizontal, with surface condensers, and of two vertical water tube boilers; the cylinder to be 30 inches in diameter, and the stroke of the pistons 18 inches; the two boilers to contain 91 square feet of grade surface, and 2,700 square feet of heating surface. No proposals will be considered except from the proprietors of engine building establishments. Screws are not well adapted for vessels of light draft when great speed is required, as the screw is most effective under a considerable head of water. We want gunboats of light draft, very fast and strong, so as to run down any craft of ordinary character. As paddle wheels, however, are not suited for war vessels, they being too much exposed, the best way to secure speed with light draft, when using a propeller, is to employ a screw of reduced diameter and moderate pitch, and give the shaft a proportional increased velocity to compensate for the reduced size of the screw.

THERE are 1,863 registered merchant steamers in Great Britain, of which 1,001 have iron hulls. Of this number, 1,201 have paddle wheels, and 572 screws.

## Improvement in James' Shot.

MESSEURS. EDITORS:—In a discussion at the Polytechnic, reported on page 282 of the present volume of the SCIENTIFIC AMERICAN, is a suggestion of Capt. Bartlett's that General James' shot might be improved. Such improvement I propose to make by tinning or galvanizing the parts of the shot designed to receive the leaden bands, such bands to be cast on the shot while said shot is in a heated state, which will cause the lead to be finally united to the iron when cold. The heat of the shot should be sufficient to keep the metallic coating melted while the lead is being cast on. The mold should be made of iron, in two pieces, which must encompass the shot, leaving, of course, a place for paving in the metal. W. J. SANDERSON.

Syracuse, N. Y., April 29, 1861.

## A New Alloy.

We take the two following paragraphs from the Paris correspondence of the *Photographic News*:—

Mr. Aichs, of Brussels, has introduced a new metallic alloy, which is much cheaper than red copper, and even lower in price than brass, while it can advantageously replace those metals in naval constructions and other branches of industry. It has more tenacity than copper or brass, and is less subject to oxydation. It possesses the great advantage of working as well cold as when heated; it may be forged without losing its cohesion; it melts readily, and can afterward be submitted to the operations of hammering, rolling and punching. In a state of homogeneous fusion, this alloy consists of 60 parts copper, 38.2 of zinc and 1.8 of iron.

## THE THEORY OF MAKING STEEL.

The conversion of iron into steel has taken another step toward a satisfactory theory of cementation, through the labors and intelligent experiments of Captain Caron. The result of his last researches may be summed up as follows: 1. That in industrial metallurgy cementation is always produced by means of a cyanide, which is formed naturally in the cementation boxes, by the reciprocal action of carbon, nitrogen and the alkalis present. This is the reason why the presence of nitrogen is indispensable. 2. That, nevertheless, under certain circumstances, it is possible to cement without the presence of nitrogen; which proves, *en passant*, that steel is not, as some chemists have attempted to prove, a nitro-carbonyl of iron. 3. That to cement it is necessary and sufficient that the agent of cementation be a volatile or gaseous compound, but indecomposable at the temperature employed; in this manner the carbon is brought to a state of combination in the very pores of the iron where this metal appropriates it in its nascent state. 4. That native carbonate of baryta, or carbonate of strontium, mixed with carbon is susceptible of becoming one of the most useful and economical agents of cementation, on account of its unalterability and its power. The question of effectual and economical cementation of iron would appear now to have attained a satisfactory solution. The above mixture, once formed, may be employed indefinitely; it will only require the addition of a small quantity of carbon occasionally, to supply the loss of such portions as may be accidentally consumed. The barium, after yielding up its carbon to the iron, becomes regenerated by the oxyd of carbon, always present at the same time with nitrogen, in the cementation boxes.

[On page 321 of the present volume of our journal, we questioned the theory that nitrogen is essential to the production of steel; and we said that "the common process of converting scrap iron into steel would lead us to conclude that nitrogen was not an element necessary to the manufacture of steel." The last number of the *London Mechanics' Magazine* (May 10th) received by us, contains a communication from Robert Mushet, a distinguished scientific and practical steel manufacturer, in which he confirms the views we have taken of this question. He asserts that the use of cyanogen compounds have been known in England, in the manufacture of steel, for 60 years, but no bad steel was ever improved by cyanogen or nitrogen compounds. He asserts that no nitrogen ever finds its way into the melting pots in which the best cast steel is fused, and he completely ignores the nitrogen theory in making steel.—Ed.

PLANT CORN.—Our news from France makes it evident that the crops will be short in that country, and that we shall have a continuance of foreign demand for our breadstuffs. It is impossible to exaggerate the importance of this—it will enrich our farmers and keep specie in the country, thus strengthening us and enabling us to keep the government supplied with the means of carrying on the war. Let every farmer who loves his country, and who understands his own interest, plant as great a breadth as he possibly can. The news from France makes it evident that prices will be remunerating, and that the Old World will be ready to take all we can spare, and pay cash for it. The prospect is a good one for all farmers who have the foresight to take advantage of it. A soldier must eat, and the waste consequent upon military operations will cause a larger consumption per man than in time of peace.

**Improved Portable Tent.**

Any man who has slept in the open air in a rainy night can appreciate the value of a tent that will keep him dry, and if such a tent can be made of so small bulk that it can be carried on a knapsack, and of less than three pounds in weight, probably every soldier would be willing to carry one for the sake of its shelter. The tent here illustrated was invented by E. C. Williams, of Jersey City, N. J., and is designed to be carried on the back of a soldier, for whose exclusive use it is appropriated.

Its length is 6 feet 4 inches; width at top, 24 inches; width at bottom, 2 feet 9 inches; height at the head, 27 inches; height at the foot, 10 inches; weight, all complete, 2 lbs. 6 oz. to 2 lbs. 8 oz. When rolled up, the size of the roll is 3½ inches in diameter and 16 inches in length.

It can be carried either in or on the knapsack, and can be erected in less than one minute. It will shed rain perfectly, and severe storms will not blow it over.

The braces which support the head are made with joints in the manner of a fish rod, so as to be readily taken apart and rolled up inside of the canvas.

Application for a patent for this light, compact and efficient shelter has been made through the Scientific American Patent Agency, and further information in relation to it may be obtained by addressing the assignee, James Flanagan, No. 474 Broadway, New York.

**Oddities of Invention.**

A very high appreciation of that which is simply curious in art was universally entertained in former times. We, more practical than our ancestors, attach higher value to that which is really useful, and curious contrivances of mechanical skill are abandoned to conjurers and toy manufacturers. One or two samples of the kind of inventions which were of old particularly esteemed, may not be uninteresting; but, at the same time, it is necessary to premise that these descriptions, being taken from the accounts which have been bequeathed to us by those who knew little either of science or mechanics, it is not unlikely that some of the statements may be exaggerated, and undue importance have been given to things which would now scarcely excite interest.

Petrus Ramus tells us of a wooden eagle and an iron fly, made by Regiomortanus, a famous mathematician of Nuremberg. The eagle was made to spread its wings, fly in the air, and, meeting the Emperor Maximilian some distance from the city gates, salute him, crown him, or something of that sort, and follow him back to his palace. This mechanical eagle—our French neighbors employ a live eagle on similar occasions—is said to have excited great astonishment in all who have witnessed its flight, and a poet has described it:—

Mounting from his fist that framed her,  
Flew far to meet the German emperor;  
And having met him, with her nimble train  
And pliant wings, turning about again,  
Followed him close unto the castle gate.  
Of Nuremberg, where all their shows of state,  
Streets hanged with arras, arches curious built,  
Gray-headed Senate, and youths' gallantries,  
Grace not so much as only this device.

The same poet describes the iron fly:—

Once, as this artist, merrily with mirth that meat  
Feasted some friends whom he esteemed great,  
Forth from his hands an iron fly flew out,  
Which, having flown a perfect round-about,  
With weary wings returned unto her master.  
And as judicious, on his arm he placed her.  
O, wit divine, that in the narrow womb  
Of a small fly, could find sufficient room  
For all these springs, wheels, counterpoises, chains,  
Which stood instead of life, and blood, and veins.

In the twentieth year of Queen Elizabeth, Mark Scalot, a blacksmith, made a lock, consisting of eleven pieces of iron, steel and brass, all of which, together with a pipe key to it, weighed but one grain of gold; he made also a chain of gold, consisting of forty-three links, whereunto, having fastened the lock and key before mentioned, he put the chain about a

flea's neck, which drew them all with ease. This is, perhaps, the earliest specimen of fleas—artificially—industrious on record.

An old writer tells us that Janellus Turrianus, "a great master in the mathematics," amused the leisure of Charles V.—he who was frightened into a monastery by a comet—by exhibiting "miracles of study." Sometimes he sent wooden sparrows into the Emperor's dining room, which flew about there and returned; at other times, he caused little armed men to muster themselves upon the table, and artificially move according to the discipline of war, "which was

The shell, *aa*, is turned down or cast smaller at the rear end, so as to pass through the ring, which is made externally of the same size as the body of the shell. As the powder is fired, the expanding gases, pressing against the lower or rear end of the ring, fold the corrugations together, and force out the exterior portion into the riflings, completely filling them and preventing all windage. This action presses out the grease, *cc*, through the holes, *dd*, made in the metal for this purpose, and completely lubricates the bore of the gun.

Mr. Cochran contends that the expansion of the ring, owing to its corrugated construction, must necessarily be so perfectly equal in every direction that it will lift the rear end of the shot or shell exactly into the middle of the bore; and not only so, but that the powerful toggle-lever purchase, obtained by the closing together of the corrugations, will pry up the forward end of the shot also so that the axis of the shot will precisely coincide with the axis of the bore. He says that the weight of the shot is insignificant when opposed to the tremendous power exerted by the corrugations thus coming together under a pressure of 5 or 10 tons to the square inch.

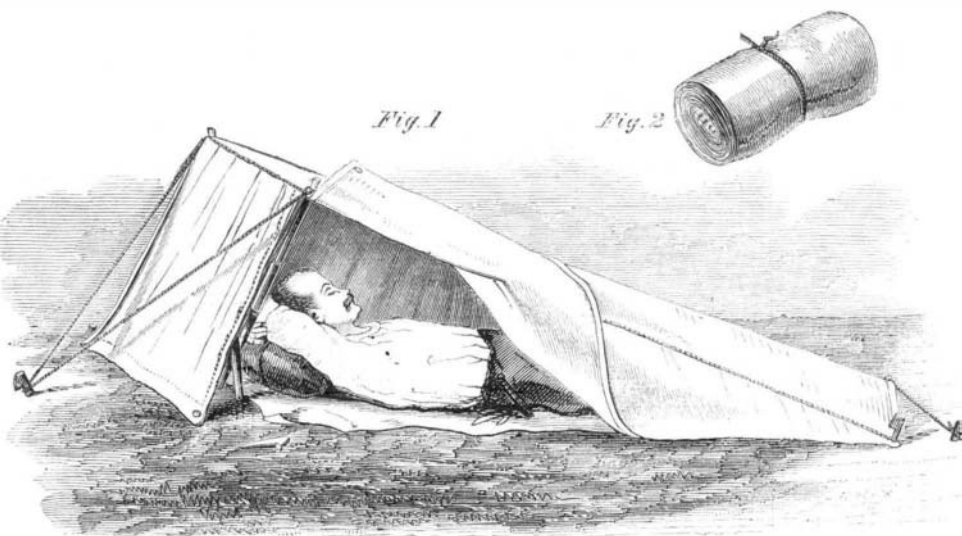
The advantages of this ring are thus stated by the inventor:

"The great advantages in this mode of closing the windage, and of course filling the rifle grooves to a rifled cannon, are obvious. 1st, The forcing forward or closing up the corrugations of the expanding rings, not only perfectly fills the bore of the piece and centers the shot, but firmly grips or attaches itself to the projectile, so that no part of it can leave it in its flight, which is a matter of the first importance. 2d, The inside recesses furnish a very safe and convenient place to deposit the lubricating material, and will always be sure to be forthcoming when the discharge takes place, to lubricate the rifle grooves. Grease should never be applied to the surface of the shot, as it will collect dirt and sand, and is liable to be destroyed by vermin when exposed. 3d, The ring occupies but a very little part of the body of the shot, and therefore leaves nearly the whole space for the bursting charge. As the end of the shot passes through the ring, say a quarter of an inch, which is of the same size as the body, the shot can be packed in boxes on the base end, with the point upwards in the usual way, without injury by jolting or jarring in transporting.

"Any kind of malleable metal may be used for the corrugated ring (wrought iron has been used successfully); soft copper is preferred. By being struck up in dies, the rings can be made very light and strong, and the copper is found to work well. Lead has not been found to answer well, particularly in heavy shot, where it is very likely to get bruised or pressed out of shape in handling and transporting, and will lead or fill up the rifle grooves, particularly in iron guns when rusty. It is so soft that sharp sand will imbed or get jammed into it, and, of course, cut out the lands of the rifle bore. Copper at first cost is quite as cheap as lead, only about one-fourth its weight being required. By the complete closing of the windage about three-fourths of the powder is saved—experiments having shown that one ounce of powder to the pound of shot is sufficient, while the United States service charge is one-quarter of a pound of powder to the pound of shot."

Mr. Cochran has been making numerous experiments with this shot, and he says that, with the same weight of shot and powder, he has made as accurate shooting, with as low an elevation and as great power of penetration, as has ever been made with any breech-loader, under the same conditions of weight and size of gun, weight of charge, &c.

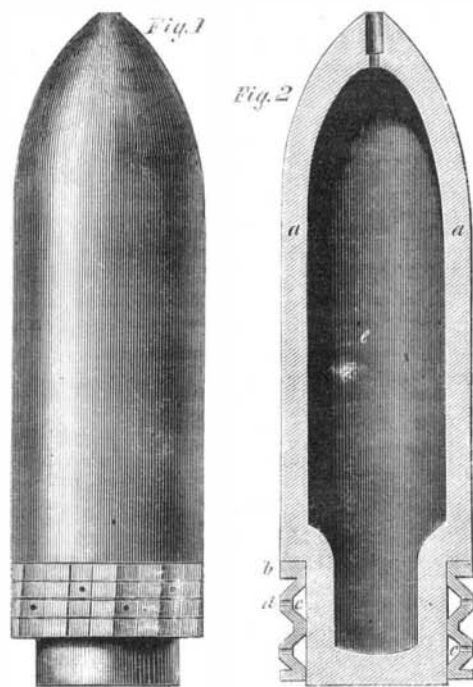
Any further information will be given on application to the inventor, No. 160 Broadway, New York.

**WILLIAMS' IMPROVED PORTABLE TENT.**

done so beyond example that the superior of the religious house of St. Jerome, being ignorant of the mysteries of art, suspected him of witchcraft."

**COCHRAN'S CORRUGATED RING OR CUP PROJECTILE.**

We here present an illustration of another packing ring for elongated shot, so entirely novel in its character as to attract the attention of all who take an interest in this department of science. It was invented by J. W. Cochran, Esq., the gentleman who took a revolving cannon to Turkey some years ago, and received a gold medal and more substantial acknowledgments of its value from the Sultan. The inventor is a man possessing great talent as an inventor, and one who has, perhaps, given as much attention to rifled ordnance as any person in the country.



The ring or cup here illustrated is made of any malleable metal, though experiments have demonstrated the superiority of copper for the purpose. It is cast as nearly perfect as may be, and then finished by being struck up in a mold with an expanding die.

Fig. 1 is a longitudinal central section of a shell, showing the corrugated ring before firing; and fig. 2 is a perspective view of the shell after being fired.

Any further information will be given on application to the inventor, No. 160 Broadway, New York.