

**INVENTORS THE PROSPEROUS CLASS.**

There is no class of persons in these war times who seem to be more prosperous than the inventors and patentees.

We have heard of a number of sales of patents lately at remunerative prices, and a few that are doing extraordinarily well in manufacturing articles protected by their patents, even in these dull times. The patentees of articles used in camps and by the army, are reaping a rich harvest. There is an enormous demand for improved firearms, cannon, shells, projectiles, explosive grenades, and military accouterments of all kinds. More than half our entire patent department force is kept constantly employed on this class of inventions, and a great proportion of the applications for patents which have passed through this office within the last two months are on the following inventions, which, in the aggregate, pertaining directly and indirectly to the war, amounts to more than one hundred:—Improved breech and muzzle-loading cannon; mode of mounting and operating heavy ordnance; improvement in guns, pistols and locks; improvement in projectiles and shot, the number of the two latter being very large; improvement in bits for cavalry horses; improvement in stirrups; improvement in drinking cups and drinking tubes for soldiers; tents, camp beds and tables combined; epaulets and mode of fastening; modern portable huts for soldiers; military caps, combining lightness and peculiar shapes for protecting the wearer from the sun, &c. Some of these inventions have been already adopted, and the manufacturers are making money out of their contracts, while others are patiently waiting the action of the officials before whom their inventions have been submitted for examination.

We recognize in some of the inventions in this line, which have passed before us, much novelty and apparent utility, but a large proportion of the plans submitted to us are wanting in both novelty and utility, and on not more than one-fourth of the plans submitted to us can we advise parties to be at the expense of applying for Letters Patent.

We are happy to examine models, or drawings, and descriptions of inventions in this line, and will cheerfully advise parties as to their patentability without charge. Communications should be addressed to Munn & Co., New York, as indicated in our advertising columns.

**California Wool Lambs.**

American woolen manufactures have increased rapidly during the past ten years, and the native supply of wool seems to be keeping pace with the demand for it. California has now become a great sheep-raising State, and the wool is of an excellent quality. The stock of sheep, as stated in the *California Farmer*, was doubled last year, and at the Mission San José, a merry sheep-shearing festival was held on the 10th of May last, on which occasion a flock of 700 full-blooded merinos, belonging to Mr. A. E. Field, were shorn of their fleeces, which averaged six lbs. each. Sheep are exceedingly prolific in the Golden State, and they early come to maturity. As the supply of cotton may be much diminished this year, there will be a greater demand for woolen fabrics in the form of flannels, next year; hence it will be the policy and duty of farmers and all who are engaged in sheep raising, to preserve their lambs this season for the sake of their fleeces.

**BRIDGE-BURNING.**—This seems to have become as much a part of the war as the sword and the musket. The Baltimore and Ohio Railroad has suffered terribly at the hands of the secessionists, by the destruction of its bridges, tracks, locomotives, cars, &c. The following bridges along the line of the road have been destroyed:—Opeguon creek, 147 feet span; Sleepy creek, 219; Paterson creek, 145; North Branch river, 131; Buffalo creek, No. 2, 108; Buffalo creek, No. 3, 156; Martinsburg, 200; and Harper's Ferry, 1,050 feet span. Total, 2,156 feet. It is said that some of the chief officers of the road have been favoring the rebellion as much as they dared. Of this, however, we have nothing but rumor.

In a recent engagement at the Cape of Good Hope, between the English troops and some of the native insurgents, 80,000 shots were expended in killing twenty-five men.

**French Arms for the United States.**

Major-General Fremont, who, at last accounts, was in Paris, expects to bring home with him arms and accouterments for 10,000 men. His contract reaches \$250,000. The first purchase he made reached \$75,000; and, what is curious, they were rifles (Enfield), bombs, percussion caps, and other articles belonging to the Pope. They had been prepared on contract for the Papal army, but on account of the defeat of Lamoriciere, had, it is said, never been delivered nor paid for. It is said that if the American government will make a direct demand on the French government, through the American Minister, for arms from the French manufactories, it will be granted. The greatest arm of modern warfare is the small rifled piece (6 and 12-pounders), of the French army, mounted in a large proportion as flying artillery. It was this that did most in deciding the battles in the late Italian campaign in favor of the French, and they must decide every field battle in favor of the side that has most of them.

**Hints to Volunteers—Keep Your Shoes Easy.**

We take the following good advice to volunteers from the June number of the *Atlantic Monthly*:—

A soldier's needs, beside his soldierly drill—first, good feet; second, a good stomach; third, and after these come a good head and a good heart. But good feet are distinctly the first thing. Without them, you cannot do your duty. If a comrade, or a horse, or a locomotive, takes you on its back to the field, you are useless there. And when the field is lost you cannot retire, run away and save your bacon. Good shoes and plenty of walking make good feet. A man who pretends to belong to an infantry company ought always to keep himself in training, so that any moment he can march twenty or thirty miles without feeling a pang or raising a blister. Was this the case with even a decimation of the army who rushed to defend Washington? Were you so trained, my comrades of the Seventh?

A captain of a company who will let his men march with such shoes as I have seen on the feet of some poor fellows in this war, ought to be garroted with shoe strings, or, at least, compelled to play Pope, and wash the feet of the whole army of the Apostles of Liberty.

If you find a foot soldier lying beat out by the roadside, desperate as a seasick man, five to one his heels are too high, or his sides too narrow or too thin, or his shoe is not made straight on the inside, so that the great toe can spread into its place as he treads.

I am an old walker over Alps, across the water, and over Cordilleras, Sierras, deserts and prairies at home; I have done my near sixty miles a day without discomfort—and, speaking from large experience, and with painful recollections of the suffering and death I have known for want of good feet on the march, I say to every volunteer: Trust in God, but keep your shoes easy!

**Making Statues by Photography.**

We take the following from the Paris correspondent of the *London Photographic News*:—

For some time past rumors have circulated of a marvelous application of photography to sculpture, made by a young Belgian artist, François Willème by name, which, in the absence of full particulars, was looked upon with doubt and suspicion as a seeming impossibility was involved in it. Nothing more nor less than the actual production of statues, &c., by the agency of photography, without the aid of the sculptor's hand, was claimed for this new discovery or invention. At first sight this proposal would really seem to involve a contradiction, as two arts, based on entirely different principles and methods, were ostensibly combined in one. For how could it be supposed that by any graphic process whatever, a plastic work could be obtained, seeing that one produces its results on a plane surface by means of light and shade, and the other by relief? However Mr. Willème appears to have solved this singular problem, and the results pronounced by competent authority to be unexceptionable, are now before the public; and as you have now the details of the process at hand, you can readily judge for yourself whether the applications of photography are not surprisingly and ingeniously enlarged by the genius of Mr. Willème. He claims to have demonstrated that, by the aid of photography, he can produce sculptures from nature, from the living model, from the inert model, from microscopic objects enlarged, sculptures of the same size as the model, or enlarged or diminished, grotesque sculptures, bas or alto-relievos.

**DAMAGES CAUSED BY THE WAR.**—General McDowell, of the United States Army, commanding in Virginia, contrary to the insinuations of General Beauregard, has issued an order requiring commanders of regiments, so far as possible, to ascertain the value of property taken or damage sustained by the owners thereof. Citizens who have sustained any damage or loss are called upon to present their claims to the commanding officer, that justice may be done alike to the citizen and the government.

**MORE RIFLED CANNON.**—The War Department, we see it stated, has made a contract with the Phoenix Iron Foundry of Pennsylvania for the construction of 600 rifled cannon.

The duty on foreign salt has been abolished in France, in order to aid the fisheries.

**The Best Variety of Strawberry.**

At a meeting of the Fruit-Grower's Association of Eastern Pennsylvania, a vote was taken on the best varieties for general (market) culture and for amateur culture, with the following results:—

GENERAL CULTURE.	
Votes	Votes
Albany..... 25	Vicomtesse Hericart..... 5
Hovey..... 8	Longworth's Prolific..... 5
Triomphe de Gand..... 7	Large Early Scarlet..... 4
Iowa..... 6	Globose Scarlet..... 4
McAvoy's Superior..... 7	Trollope's Victoria..... 3
Cushing..... 6	Walker, Willey and Mc-
Boyd's Mammoth..... 6	Avoy's Extra Red(each) 1
Boston Pine..... 5	

AMATEUR CULTURE.	
Votes	Votes
Triomphe de Gand..... 11	Peabody..... 5
Vicomtesse Hericart..... 10	Walker..... 4
McAvoy's Superior..... 7	Trollope's Victoria..... 4
Hovey..... 7	Boston Pine..... 4
Hooker..... 6	Burr's New Pine..... 4
Jenny Lind..... 6	Iowa..... 1

The strawberry can be transplanted at any season of the year when the ground is not frozen. It is the most easily raised of any fruit, and comes most quickly into bearing. If any one of our readers who has a square rod of arable land has not some of this delicious fruit growing, we have no doubt he will find the cultivation satisfactory. For field culture, plant in rows five feet apart, and let the vines cover half the ground. For garden culture in small beds, plant in single hills 2½ feet apart. Have the ground rich, and keep it clear of weeds.

**FUSION OF PHOSPHORUS.**—The Abbé Laborde has observed a new and important property of phosphorus, the knowledge of which may prevent many serious accidents in the manipulation of this combustible.

Take a stick of phosphorus, quite dry, and scrape it with the blade of a knife, so as to detach some fragments, and collect them on a sheet of paper. So long as they remain detached from each other they do not alter their appearance, but the instant they are brought into contact they suddenly melt, and undergo a semi-fusion; the temperature rises, and sometimes inflames spontaneously.

If instead of detaching the light fragments of phosphorus a thin slice is cut off, in a few moments the edges melt, and if the fusion is rapid, spontaneous inflammation becomes imminent.

**PERCUSSION CAPS.**—A Southern journal states that a gentleman of Fredericksburg, Va., has succeeded in making a very excellent article of caps out of leather and paper. He was in Richmond, examining the machinery for making copper caps, so as to model his after the same pattern. The scrap leather pieces are pressed into shape while wet, are then allowed to dry, and filled as copper caps are with the detonating substance. Both the leather and paper caps are said to be as effective as the regular copper caps. The discovery of this singular war material he thinks has found a way to make both the leather and paper impervious to water.

**ANOTHER SECESSION HITCH.**—A dispatch from Washington says:—

“Governor Pickens has issued a proclamation forbidding any more South Carolina troops from leaving Palmettodom. He expresses the belief that the Northern hordes contemplate an invasion of the sacred soil of South Carolina, via Charleston, and says that the first duty of South Carolinians is to the State.”

On the Confederate theory South Carolina has an unquestionable right to withdraw her troops from Virginia. The State is sovereign; her first duty is to herself; and whenever her Governor sees fit he can recall his forces. This movement of Governor Pickens is an admirable commentary upon the confederate system. Jeff. Davis is a mere tenant at will.

The “Soldiers' Friend, or Hints for the Physical and Moral Welfare of the Soldiers of the United States,” by Dr. Zeigler, of Philadelphia, has recently been issued by Lippincott & Co., of that city. It contains much good counsel in the compass of seven 18mo. pages. Mr. S. S. White, a public spirited gentleman of the Quaker City, has caused to be printed 20,000 copies for gratuitous distribution among the Pennsylvania volunteers. Parties wishing to follow the example of Mr. White will be furnished by the publishers at the rate of \$5.50 per 1,000 copies.

In the Russian navy there are two hundred and forty-three steamers and seventy-one sailing vessels, carrying 8,851 guns.

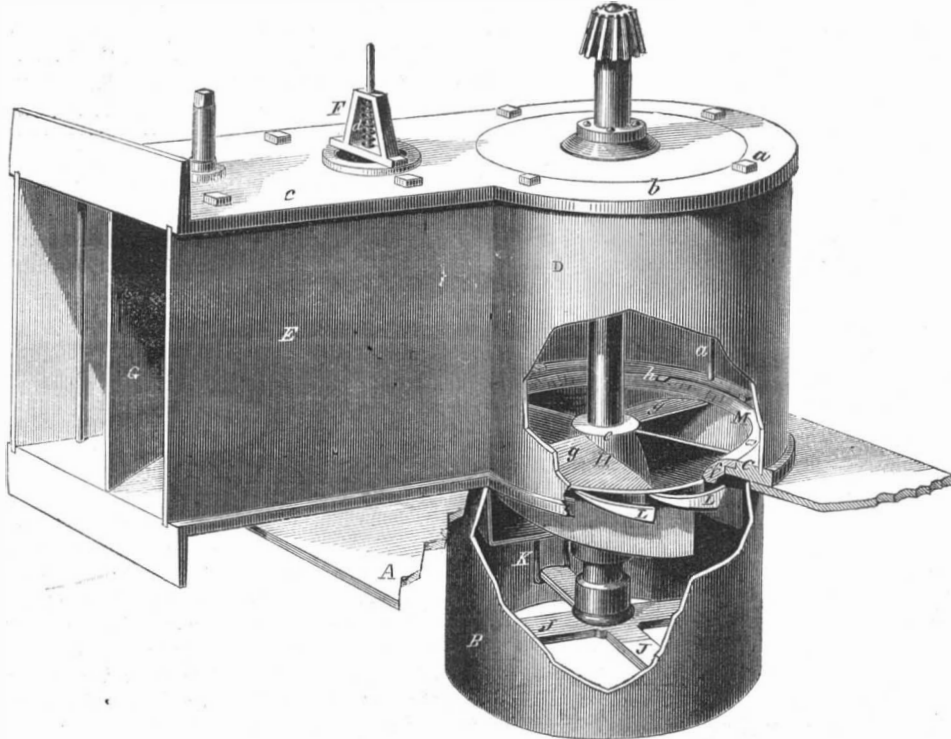
### Improved Water Wheel.

Morin, who gave the name of "turbine" to a certain class of water wheels, defines the term as meaning wheels upon a vertical shaft. On that unquestionable authority we designate the wheel here illustrated a turbine. There seems to be no more prospect of inventions ceasing in this class of wheels than in the steam engine; the endless variety of ideas which may be originated in connection with it being strikingly manifested by the improvements and modifications which the inventor of this wheel illustrates in the annexed engraving. Its purpose is to economize in the use of water by appropriating the leakage water so as to utilize its force in driving the wheel, to obviate the friction hitherto produced by water-tight joints, and to discharge the water from the wheel after the closing of the gate, so that the wheel and penstock will be free from water when not in operation. The modification also renders the parts very accessible for the purpose of repairs.

The construction of this wheel is plainly shown in the engraving, which is a perspective view, with a portion broken away to display the interior. A represents a horizontal foundation or bed-piece, in which a draught tube, B, is fitted; this tube being of cylindrical form and of a size properly proportioned to the size of the wheel. C is an annular flanch or plate which is placed on the top of the draught tube, and D is a penstock which is placed on the flanch or plate, C, to which it is secured by screw bolts, *a*. The lower end of the penstock is "let in" the flanch, C, to insure a firm and water-tight connection. E is a water induction passage which communicates with the penstock, D; it is closed at the top by a cover, *c*, which is provided with a valve, F, and has a gate, G, at its outer end. The gate, G, may be an ordinary swinging or sliding vertical gate, and the valve, F, may be an ordinary puppet valve, having a spring, *d*, on its stem to keep it closed when not otherwise acted upon, the valve opening downwards. H represents the wheel, the shaft, J, of which has its upper bearing at the center of the cover, *c*, the lower end of the shaft being stepped at the junction of the bars, J J, which cross each other at right angles, and are suspended by stirrups, K, from the flanch, C. The wheel, H, is composed of a hub, *e*, which is connected with a rim, *f*, by buckets, *g*, the buckets being of spiral form as usual. The upper edge of the rim, *f*, is inclined at an angle of about 45°, and to its lower edge are attached auxiliary buckets, L. These buckets are simply plates or projections of suitable length, inclined longitudinally, and projecting at right angles to the rim, *f*. On the annular plate or flanch, C, there is secured by bolts, *h*, a conical rim, M; this rim is bolted water-tight to the plate or flanch, C, and it extends to the rim, *f*, of the wheel, H, nearly touching the wheel. The lower edge or face of the rim, M, is parallel with the face of the rim, *f*, and the space between the two is directly over the buckets, L. When the wheel is in operation, the water that leaks through between the rims, M *f*, acts upon the buckets, L, and thus aids in driving the wheel. By this arrangement much friction is obviated, as the rims, M *f*, do not require to be brought in close contact in order to form a water-tight joint as hitherto.

By the employment of the valve, F, the water in the penstock, D, is made to leave the penstock entirely when the gate is closed, the vacuum which would otherwise be produced in the penstock on the water leaving it being prevented by the opening of the valve by the external pressure of the atmosphere. By removing the nuts of the screw bolts, *a*, the wheel may be readily withdrawn from the penstock and all of the parts rendered accessible for repairs.

The patent for this invention was granted through the Scientific American Patent Agency, July 24, 1860, and further information in relation to it may be



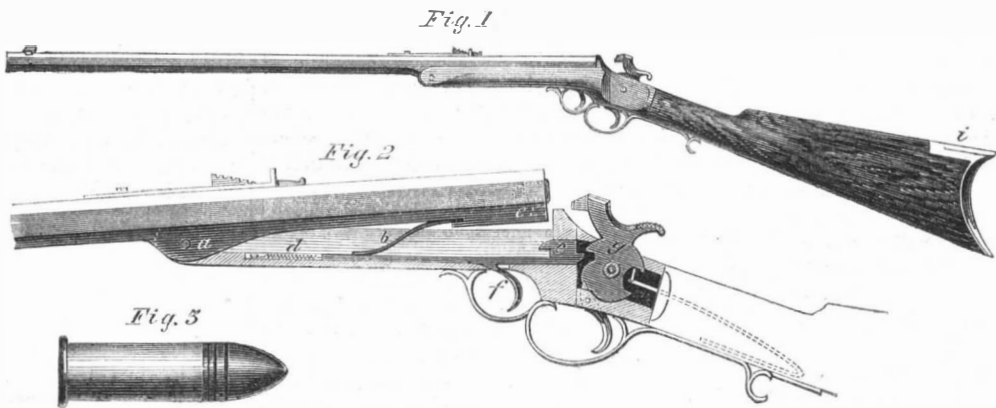
### TRUAX'S IMPROVED WATER WHEEL.

obtained by addressing the inventor, Jacob W. Truax, at West Concord, Vt.

#### Improved Breech-Loading Rifle.

Though we have little faith in breech-loading cannon, we have the highest opinion of breech-loading small arms. The great and apparently fatal objections to the former do not apply to the latter; while the advantages of breech-loading rifles, especially for soldiers, are very important. The principle of these is the great rapidity with which the arm can be loaded and discharged; and there are others, which, though of a secondary nature, are still worthy of consideration. Among these are the perfect protection of the muzzle from wear and facility for cleaning.

The breech-loading rifle here illustrated is one of the best and most simple, if not the simplest, that has yet been devised, the lock consisting of only three pieces.



### WESSON'S BREECH-LOADING RIFLE.

In the engravings, fig. 1 represents the arm in position to be discharged, and fig. 2 shows it with the breech open, and the cartridge inserted, which is represented of full size in fig. 3. The bore is open clear through the gun, so that the cartridge may be slipped into the breech, as shown. The cartridge case is made of thin copper in the present approved form, with a conical shot attached; a little percussion powder being placed in the bottom of the cartridge. The barrel is secured to the stock by a pivot,

*a*, and the spring, *b*, throws up the breech, when the latter is released from the catch, *c*, which holds it in its place. This catch is drawn forward by the spiral spring, *d*, when the breech is down, entering the recess. The breech is raised to receive the cartridge by drawing back the catch, *c*, by means of the forward trigger, *f*, which is attached to the catch. The cock and tumbler are all formed in one piece, *g*, and *h* is the main spring with a short vertical elbow upon its end pressing against the tumbler, as shown; a slot is made in the metal, *i*, behind the breech of the barrel to admit the projection on the end of the cock to strike the rear of the cartridge and explode the fu- minating powder which it contains. The copper cartridge case is withdrawn after each discharge, thus removing a considerable portion of the dirt. This case also serves to make a more perfect closing of the breech.

This rifle was invented and patented Oct. 25, 1859, by F. Wesson, of Worcester, Mass. A company under the title of the Smith & Wesson Fire Arm Co. have been formed, who manufacture the arm in the most beautiful style, at Worcester, Mass. J. W. Storrs, No. 12 Chambers street, New York, is agent for the company, of whom further information may be obtained. Army and sporting rifles and pistols, constructed on the same plan, are furnished to order at wholesale or retail at the manufactory, or by Mr. Storrs in this city.

#### Sawyer's Projectile.

The papers are saying agood deal about the wonderful success of Sawyer's projectile in some recent practice at the Rip Raps, at the mouth of Chesapeake Bay. The result are no greater than should be produced by any projectile adapted to rifled cannon. Experiments in our army, as well as in all others, are rapidly convincing military men that the day for smooth-bored cannon has gone by, and that all artillery must henceforth be rifled. It is only by careful and repeated experiments that the comparative merits of the numerous projectiles which have been devised for rifled cannon can be ascertained. A very elaborate series of experiments for this purpose was being conducted under the direction of competent officers of the ordnance department of the army, when they were interrupted by the inauguration of war. Among the projectiles which had been tried was Sawyer's. This is a single mass of cast-iron with numerous wings upon it, planned to fit the rifle grooves in the gun with a corresponding spiral. It is essentially the same as Sigourney's, illustrated on another page, except that the latter has but two wings in place of some 12 or 14 in Sawyer's. The objection made to these shot with cast-iron flanges is that they wear off the lands, or projections between the grooves of the rifled cannon. Sigourney

A LIBERAL PRESENT.—Elias Howe, Jr., the sewing machine inventor, has presented each of the field officers of the Massachusetts Fifth Regiment with a fine horse.