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**THE GREAT VICTORY.**

There was satisfaction in Athens when the overwhelming danger to the Republic from the hosts of Darius was scattered at the battle of Marathon; there was relief throughout Greece when the still greater power of Xerxes was broken at Plataea; the bells of England rang with gladness when the Invincible Armada was swept away by the fleets of Elizabeth; but never since the beginning of the world has there been so wide-spread, exalted, and profound joy as that which filled the hearts of the American people when the telegraph flashed the intelligence over the land that the central power of the rebellion was broken in pieces.

And well we might rejoice. This great event stirred all the emotions of the heart. It appealed to all that is weakest and strongest, to all that is highest and lowest in human nature. The first thought was a feeling of triumph over the formidable enemy that was struggling to destroy the nation, an enemy defiant, haughty, contemptuous and absolutely fiendish in his malignant cruelty. But the strongest emotion was gratitude for the safety of the unity and power of the nation through the great peril. It was well understood that the question at issue was, whether this country should be broken up into hostile and contending fragments, burdened with the support of vast armies and navies, passing the time in brief alternations from peace to war, now watching with jealousy the growth of each other's power, and now cutting each other's throats; or whether we should be one great, united, harmonious people, settling our disputes by decisions of the Supreme Court, with the inconceivable blessings of popular education spread throughout our borders, with an organized, prosperous, contented and hopeful industry, with the means of happiness more abundantly and more widely diffused, and with the masses of the people raised higher in the scale of humanity than has ever yet been known in the history of the human race.

For the right determination of this great debate the heart of the nation is moved with inexpressible gratitude to the brave and devoted soldiers of our patriot army. Among so many thousands there are doubtless considerable numbers of scoundrels, but on the whole there has never before been marshalled in the ranks of war a body of men so high in all mental and moral attributes as those who are now engaged in the glorious work of crushing to earth the last remnants of this most wicked rebellion. The army that came nearest to ours was doubtless that of the Roundheads of England, but when we con-

sider the progress that has been made since 1640, in civilization, and especially in general education, there can be no doubt that our soldiers are superior in intelligence and character even to the fine body of men that were led to invariable victory by Oliver Cromwell. Braver than the "Ironsides" it were perhaps impossible for soldiers to be, but impartial history will pronounce those not less brave who bent their heads and went forward through the withering fires of the Wilderness, and dashed themselves so many times against the impregnable defences of Spottsylvania.

With this gratitude to the soldiers comes the slow but inevitable recognition of the greatness of their commander. General Grant may not have an intellect superior in its power of comprehending problems, but through all future generations his memory will occupy the very highest position among those eminent men who have been great in action. The mind that he has is all wisdom; it is a guide to conduct; it throws its light upon the untrodden way. His judgment is healthy and sound, and is not disturbed by collateral and irrelevant considerations. "He has one of those rare intellects that across the maze of immaterial facts goes straight to the true point."

But the judgment of General Grant would have done nothing towards accomplishing his great achievements without those strong qualities which have carried his decisions into effect. His power of dispatching business brought all departments of his great army into the highest perfection of organization and discipline. He has, too, in an eminent degree that highest courage which has been rare indeed among the commanders of armies—the moral courage that dares to take the responsibility of battle. But the strongest element in his character is his inflexible tenacity of purpose. It is not the patience that waits in idleness, but the active perseverance that works and waits—the instinctive determination that is stimulated to more dogged obstinacy by the encounter of unforeseen obstacles, and that never thinks of looking back. This is indeed the most powerful quality in human nature, and in a contest it decides the victory. Said Wellington at Waterloo—"Three times I have saved this day by perseverance," the triumphs of Marlborough were due to the same spirit, and the highest appreciation of the noble character of Milton has declared its crowning grace to have been "his sublime and majestic patience."

The surrender of Lee, with his whole army, is a fitting conclusion of the mastery of generalship of Grant and the splendid fighting of his noble army.

**KNOWING TOO MUCH**

"A little knowledge is a dangerous thing," says Pope, and the truth of it was brought forcibly to our mind recently, when visiting a machine shop. The foreman was telling an apprentice how to do some part of the work when the youth interrupted him, saying—"I know all about it—I can do it myself." "Well!" said the foreman in reply, "I have been twenty years in this business and I can't say that I know it all. I am content to learn every day, and I think after you have lived a little longer you will find what I say to be true."

It was; we corroborate it.

It is natural that a youth should be hasty, and in the pride of his initiation into a few mysteries of his trade, fancy he is master of it all. But time brings experience to him as to us all, and that is the light which reveals, not how much but how little we know.

All knowledge is comparative, and the greatest minds are not the most ostentatious—not the most boastful of their accomplishments—but are content to acquire a little every day, to add to their stock. "There is no royal road to learning," which is to say, that the man in humble life has as fair a chance as the rich one, and that money cannot purchase mental ability, although it may bring privileges for information. In the pursuit of knowledge with facilities, not under difficulties, we are all dependent one upon the other. The practical man has his experience to demonstrate that certain effects spring from specific causes; the scientist brings his knowledge of physical laws and the properties of matter generally to bear upon the solution of a given question, and both classes work to mutual advantage; for one to sneer at the other as a visionary, or as an artisan, as

the case may be, is to show how a little knowledge can be made a dangerous thing.

**STRIKES.**

If the story of a helpless child starving to death is told in simple narrative and minute detail, it moves the sympathy, and harrows the soul of every reader; it sinks into the heart, and fastens upon the memory so that it can never be forgotten. But if the story is of many hundreds or thousands perishing by starvation, the magnitude of the suffering removes it from the scope of our sympathy.

By this principle in human nature, we all fail to form any conception of the wasting woe that is now filling thousands of households among the iron workers of England. The 70,000 men that were thrown out of employment by the great lock-out, have no means of obtaining a subsistence for themselves and their little ones but their own skilled right hands, and these are now hanging idle by their sides, in consequence of a quarrel between themselves and their employers.

While it is beyond the power of our imagination to conceive the cruelty upon the part of the iron masters which could arbitrarily bring this wide-spread suffering upon their collaborators, we are prompted to enquire whether the conduct of the workmen has been so marked by common sense and judgment as to make it a guide for imitation. This great crisis brings up anew the ever recurring question in relation to the wisdom of strikes.

There are two kinds of strikes, and one of these must certainly command the approval of all who really sympathize with the masses of mankind. That is the strike of the individual, who accumulates capital by saving till he can leave his service and go to work upon his own account. All the advance that has been made in wages, from a few pennies a day up to as many shillings or dollars, has been effected by this operation. The price of labor, like the price of everything else, is fixed by an inexorable law of nature, which no man can alter—the law of supply and demand. The demand for labor depends upon the amount of capital seeking to hire laborers. Every man who withdraws himself from the body of employed and adds himself to the body of employers, exerts a tendency by both operations to raise the wages of labor. We may hate, we may even despise, this miserly spirit, but we cannot deny that we are indebted to this very spirit of accumulation for the superiority of wages in this country and England over those in India and Ceylon.

In a nation of educated and provident workmen large numbers of individuals are constantly passing from the class of hired to that of hirers, and wages consequently are steadily advancing, without any jar, without any ill will, without any suffering. We raise no quarrel with those who think it wise and profitable to organize strikes. We are well content that every man should determine his own course in accordance with his own judgment. But for our own part, the agencies to which we look for securing a perpetual advance in wages, are common schools and savings banks.

**VALUE OF COAL ASHES.**

The *Manchester Courier* of March 11th says:—"It seems that an extraordinary rise has taken place in the value of ashes in London. A short time ago the parish of St. Pancras had to pay contractors to take them away from the houses in the district, but it has now, in consequence of the augmented value, conceded the right to collect them to Mr. Ferguson, of Paddington, for which he has paid no less than £1,800, although the concession is only for six months. But the high price tempts other speculators to poach on Mr. Ferguson's manor and yesterday morning he had to bring a man named Bridges before the Clerkenwell magistrate, for purchasing ashes of the inhabitants on his own account. The magistrate said he was determined to protect the contractor, and fined the unauthorized collector, £2. As he was unable to pay that sum he was sent to prison for three weeks."

It would be very interesting to know for what purpose these ashes are used. Muspratt gives analyses of nine samples of Scotch and Welsh coals; and of

these that from Porthmawr in Wales is about an average specimen. Its constitution is as follows:—

Silica.....	34.21
Alumina and oxide of iron.....	52.00
Lime.....	6.199
Magnesia.....	0.659
Sulphuric acid.....	4.12
Phosphoric acid.....	6.633
Total.....	97.821

The other samples are formed wholly of these same substances, but in different proportions. The silica and alumina would doubtless be combined as silicate of alumina, which is clay.

The lime would be combined first with the phosphoric acid which in this specimen would take it all. The compound formed would be phosphate of lime. This is commonly said to be insoluble and worthless, the biphosphate or super-phosphate being the soluble and highly prized fertilizer which produces such magical effects. The phosphate is, however, soluble to some extent, and is not wholly worthless as a fertilizer.

In other samples of coal ashes which have been analyzed, the quantity of phosphoric acid was not sufficient to take up all the lime, and in these cases the remainder of the lime would enter into combination with the sulphuric acid, forming sulphate of lime. This is known under the names of gypsum and plaster of Paris, as a very valuable fertilizer.

It may be that the ashes of English coals contain these two substances, phosphate of lime and sulphate of lime, in sufficient quantities to make them valuable as manures. It would be a little surprising, however, if their value for this purpose should be so great as to make the privilege of collecting them in a single district for six months worth \$9,000. This circumstance suggests the possibility that some rare metal or other valuable substance may have been discovered in them. It also suggests the desirableness of a more thorough examination of the ashes of American coals. The constitution of these is, however, so different from that of the ashes of English coals, that it by no means follows that any substance occurring in one will be found in the other.

#### MICROSCOPIC OBJECTS.

"All that tread  
The earth are but a handful to the tribes  
That slumber in its bosom."

says Bryant, speaking of the human race. With equal truth it may be said that all the hosts of mankind who have been born into the world since the creation, are but a handful to the countless myriads of beings that swarm in that invisible world which has been revealed to us by the magical power of the microscope. When we reflect that each one of these beings has his own needs and desires, his loves and battles, his career from life to death; and that every drop of every stagnant pool has been teeming with them for immeasurable ages before the existence of the human race, the mind is overwhelmed in the effort to conceive the vastness of this creation. It is an impressive thought that mankind should have lived on the same planet with this world of sentient beings for so many thousands of years without any suspicion of its existence.

It is not strange therefore, that when the discovery was made, the minds of men should be turned to the examination of their minute, strange and curious contemporaries, and that this study should be prosecuted with ever-widening interest. That this is the case we are very frequently reminded by some improvement in the microscope, by some discovery through its aid, or by some work upon its use.

We have now before us a book of 140 pages on "The Preparation and Mounting of Microscopic Objects," devoted exclusively to this department of microscopic observation. The various methods of attaching the minute specks to glass slides, so that they may be brought under the focus of the instrument, as well as the balsams and cements employed, and the different modes of preparing the objects, are very fully and intelligently discussed.

The work is by Thomas Davies, and is published by William Wood & Co., 61 Walker street, New York.

A PINE tree was lately cut in Colebrook, Conn. for the shaft of a big wheel for a Manufacturing company, which worked thirty-six inches in diameter and twenty-six feet in length. The stump was six feet through.

#### RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week; the claims may be found in the official list:—

**Protector for Baskets.**—This invention consists in applying a metallic frame to baskets in order to protect the same or preserve them from wear or injury. The invention is chiefly designed to be applied to large baskets or those in which weighty substances are conveyed or carried, such, for instance, as bushel baskets used by farmers and others, coal baskets for carrying coal, &c. Baskets of this kind are soon worn, cut, broken or destroyed, in consequence of the weighty substances carried in them, and a metallic frame renders them durable, serving as a support to the basket in holding its contents and likewise protecting it from external injuries, such as blows, concussions, &c. Philip Eley, of New York city, is the inventor.

**Means for Raising Oil from Wells.**—This invention relates to a new and improved means for raising petroleum in wells through the medium of air injected into them. The invention has for its object, first, the keeping of the air passage free from mud, sand, etc., which are liable, in the old plans, to choke all said passage; second, in having the air passage so arranged that it will not interfere in the least with the ascent of the oil in the oil tube, nor the oil interfere with the current of air—due provision being also made for the difference in the exhaustion of the oil tube and well pipe, as well as for the ready connecting and disconnecting of the several parts. The above invention is by Messrs. L. W. Turrell, Samuel Stanton, and L. C. Ward, Newburgh, Orange Co., N. Y.

**Winding up Watches.**—This invention consists of a main spring barrel composed of two barrels, one inside the other, the outer barrel being rigidly connected with the main gear wheel, and the inner barrel carrying the winding arbor, the main-spring and the maintaining ratchet, or its equivalent, in combination with two stops or dogs, one applied to the inner, and one to the outer barrel, in such a manner that, when the spring is wound up the inner barrel turns independent of the outer barrel until the two stops are in contact, and when the main spring breaks the inner barrel flies back and completes a full revolution, or nearly so before its stop strikes the dog of the outer barrel, and thus the force of the spring is spent, and injury to the mechanism of the watch is prevented. Invented and patented by G. C. Martin, Cleveland, Cuyahoga Co., Ohio.

**Roller Cleat for Trunks.**—This invention consists in the arrangement of mortises or cavities in the cleat of a trunk, in combination with rollers, the axles of which have their bearings in the sides of said mortises or cavities in such a manner that the rollers can be secured to the cleat without the use of a metal bracket, and a simple, cheap and durable fastening for said roller is produced. The ends of the cleat are made thin and turned up over the edge of the trunk in such a manner that, by the cleat, the edge and ends of the trunk are protected, as well as its bottom, and the cleat is less liable to be knocked off than it is when attached to the bottom in the ordinary manner. John A. Lieb and John Schmadel, of 69 Prince st., Newark, N. J., are the inventors of this improvement.

**PURIFYING WATER.**—A Mr. H. A. Sheldon sends the following account of an experiment to purify water:—"Having occasion to purify river water which was colored by passing through swamps containing muck, peat, and other decayed vegetable matter, I tried the usual method with alum, which deposited the mechanical impurities but left the water the color of pale sherry wine. I then mixed 1 oz. powdered alum and 2 oz. clean white clay together, for one barrel of water, made a thin paste and stirred it with the water, which, in twelve hours, was perfectly transparent and colorless. The precipitate in the latter case was of a dark chocolate, in the former a pale ashen color."

MESSRS. DAVISON, STILES & WOOLSEY, 229 Broadway, are the agents for the traveling and steam cranes illustrated on page 190 of the current volume. All letters should be addressed to them.



ISSUED FROM THE UNITED STATES PATENT-OFFICE  
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Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

47,080.—Cigarette.—L. L. Arnold, New York City: I claim, First, A new article of manufacture, a cigarette, constructed and combined in the manner described, and, Second, The method herein described of making the same.

47,081.—Cabinet Organ or Harmonium.—Thomas Atkins, Cincinnati, Ohio: I claim so arranging the stops or swells of an organ or harmonium with regard to a common lifting piece, F, operated by a foot or knee pedal, as that they may all, or any one, two or more of them, be opened or closed by said pedal, without raising the hands from the keys, substantially as herein described.

47,082.—Manufacture of Blacking, Etc.—Roberts Bartholow, Cincinnati, Ohio:

I claim the manufacture, compounding and preparation of a new and improved kind of oil blacking for leather, boots, shoes, harness and other articles manufactured, in whole or in part, of leather, composed of the ingredients above named, and manufactured, compounded and prepared in the manner and for the purposes substantially as set forth at large above.

I also claim, as a new manufacture, oil blacking for leather and other articles, made by combining petroleum or any of its products, or other hydro-carbon oils, treated substantially as hereinbefore set forth, with any suitable acids, oxides, gums or resins, substantially in the manner specified.

47,083.—Oil for Paint.—Roberts Bartholow, Cincinnati, Ohio:

I claim the manufacture and preparation of a new and improved kind of oil for mixing and compounding with white lead, zinc, white and other mineral pigments, in lieu of linseed oil and other paint oils, and for other purposes, composed of the ingredients above named, and compounded, manufactured and prepared in the manner and for the purposes substantially as set forth above.

47,084.—Process for Preparing Petroleum for the Manufacture of Paint, Etc.—Roberts Bartholow, Cincinnati, Ohio:

I claim the manufacture, compounding and preparation of paints for common purposes, of various colors and shades of color, and embracing a colors and shades of color, from crude petroleum and refined petroleum, in combination with sulphuric acid, nitric acid, acetic acid, common glue, dry white lead, or otherwise known as carbonate of lead, dry white zinc, or otherwise known as oxide of zinc, and other white pigments, and pigments of various colors, combined in the proportions and in the manner substantially as set forth above.

47,085.—Machine for Securing Soles to Boots and Shoes.—John Blakeney, Philadelphia, Pa.:

I claim, First, The screw, rod, I, and its internal wire, x, and the nut, composed of the arms, G and G', or their equivalents, in combination with the system of gear wheels herein described, or the equivalent to the same, whereby the said screw rod is caused to revolve at a faster speed than the nut, for the purpose specified.

Second, Two or more cutters, 4 and 7, arranged in the projection, m, of the rocking frame, in respect to the wire x, in combination with the slotted plates 10, or their equivalents, for adjusting the said cutters, as set forth.

Third, The support, 24, adapted to the last, in combination with the movable plate, Y, and the device herein described, or the equivalent to the same, whereby the said support can be adjusted vertically and laterally, in the manner described.

Fourth, The combination of the plate, Y, adjustable plate, 14, rocking frame, 19, adjustable support, 24, and sliding support, 15, the whole being arranged and operating substantially as and for the purpose herein set forth.

47,086.—Spring Bed Bottom.—J. Blair Bowditch, New Haven, Conn.:

I claim the combination of the slats, B B, with the wooden springs, D D, as herein described, for the purpose specified.

47,087.—Lamp Cone.—Charles H. Buckalew, Jersey City, N. J.:

I claim the construction of the cone frame with a metallic base and bifurcated connecting arch, with a filling or dome of glass blown or cast within the said frame, substantially as herein described and represented.

[This improvement relates to the construction of the air cone or flame deflector which surrounds or covers the upper part of the ordinary kerosene or petroleum oil lamps. The improvement consists in forming the cone of glass and metal combined. A frame of metal is first made, corresponding to the shape of the cone; this frame is then filled with glass, when hot, by pressure. A transparent cone is thus produced, the use of which results in obtaining probably twenty per cent more light from lamps to which the improvement is applied.]

47,088.—Breech-loading Fire-arm.—John W. Cochran, New York City:

I claim, First, So constructing and applying a breech block, having a movement such as is herein described, as to provide for the insertion of the cartridge into the barrel from the under side of the stock of a fire-arm, substantially as herein specified.

Second, Providing a cavity, c, substantially as herein described, in the under side of such a breech block for the reception of the cartridge when the gun is in the inverted position shown in Fig. 3, whereby the movement of the said block which is necessary for the insertion of the cartridge into the chamber of the barrel is greatly reduced, and the discharged cartridge shells are steadied while being withdrawn from the barrel.

Third, The construction and arrangement of the rear end of the breech-operating lever, e, substantially as herein described, whereby an opening between the said end of the breech block and the stock is avoided.

47,089.—Railroad Switch.—J. W. Colwell, Macedonia, Ohio:

First, I claim the gards, C C' d d', and guard rails, D D', in combination with the switch rails, when arranged as and for the purpose set forth.

Second, I claim placing the main track, A A', on a tangent with and at the junction of the side track, B B', in combination with the gards and guard rails, substantially as and for the purpose specified.

47,090.—Harrow and Roller Combined.—Wm. H. Converse, New Castle, Maine:

I claim the harrow, E, fitted in or to the frame, A, substantially as shown, in combination with the beat bar, F, provided with the plate.