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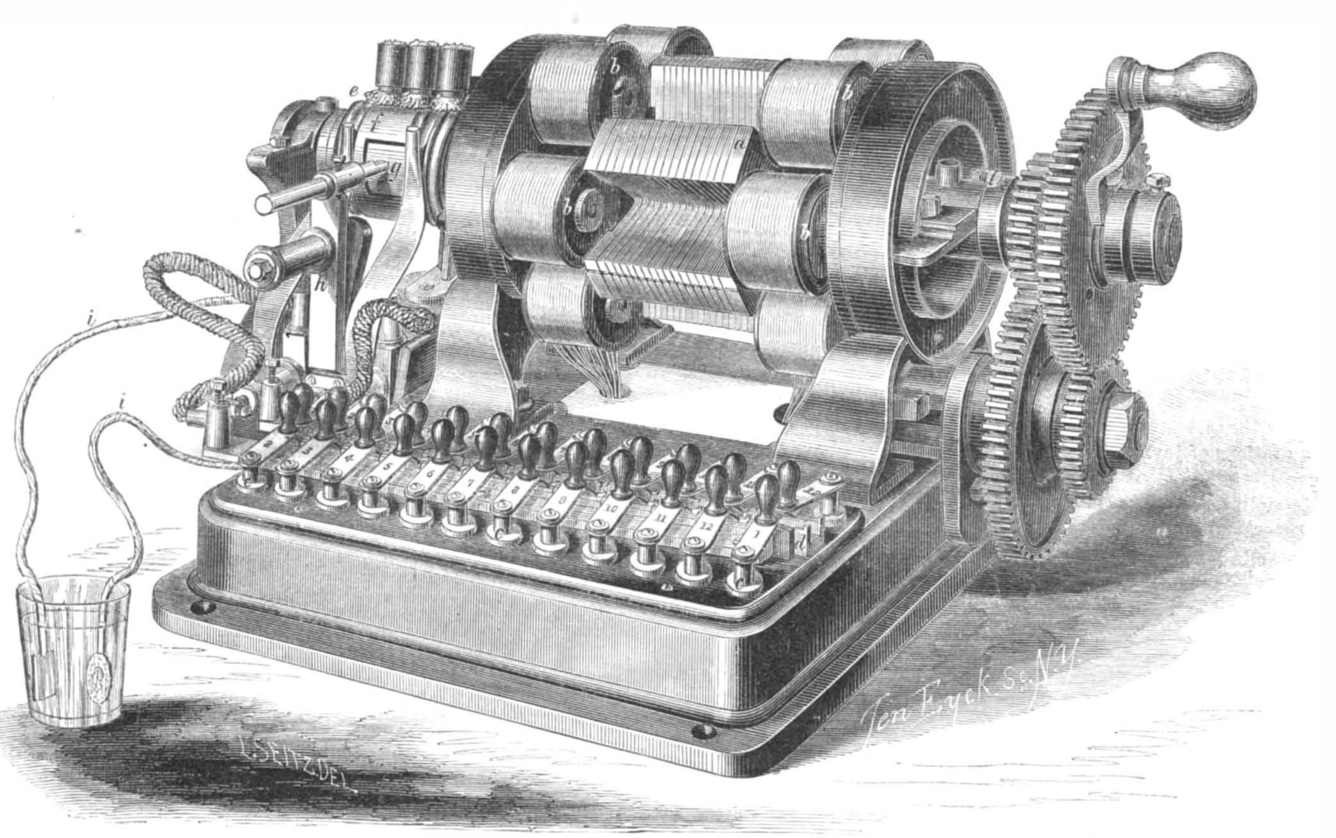
Improved Magneto-Electric Battery.

The magneto-electric battery, represented in the illustration, is, in many important particulars, entirely new. Hitherto magneto-electric machines have been organized either with straight bar or the horse-shoe ma gnet. Persons well acquainted with the construction of that form of magnets are aware of the difficulty of obtaining an exact uniformity of strength north and south, thus making the disk into a series of horse-shoe magnets joined at their middle parts into a common center. Several of these disks are then placed upon a revolving shaft to form the compound radiating magnet, *a*. Opposite the ends of the arms are placed the soft iron cores of the several helices, *b b b*; the machine represented in the engraving having six at each end of the magnet. The wires

The superior compactness of the radiating magnets as compared with all other forms for the purposes for which they are used in these organizations is a decided improvement in many particulars; more magnetism, and consequently more electricity is induced in the same space than by any other form of construction. The magnets are also manufactured with greater cheapness and facility.



BEARDSLEE'S NEW MAGNETO-ELECTRIC BATTERY.

and power in any two or more magnets. This difficulty arises from various causes, in the manufacture of the metal of which the magnets are made, in the working of the metal to form the magnets, and in their unequal, temper, &c. It is a well known fact that for the purpose of generating a large and uniform current of electricity in magneto organizations, it is of absolute necessity that all the poles of the permanent magnets should be of equal power of magnetism, otherwise the impulses will be of unequal force, and induced at irregular intervals.

Another important feature in magneto organizations is that the permanency of the magnets should be unchanged by use or time. Magnets heretofore manufactured of steel have always lost in time or by use a portion of their magnetism. This deterioration arises from causes as yet unexplained, but the fact is well known to all who have made magnets a subject of investigation.

The permanency of the magnets in this machine is secured by a certain treatment of iron, which is a secret with the discoverer. The uniformity in the strength of the poles is obtained by the peculiar manner in which the magnets are formed. From a circular disk of iron V-shaped pieces are cut so as to leave arms radiating from the center like spokes from a wheel. These arms are then magnetized alternately from these helices are carried down through the bottom plate of the machine, and each is connected with one of the keys, *c c*. These keys turn upon pivots and are so arranged in relation to insulated brass bars, *d*, placed between them, that by giving the keys a slight turn the helical wires may be joined to pass the current in succession through any two or more of the helices, or to unite the several currents from all; thus regulating the intensity and quantity of the electricity at will, to adapt the current to any purpose for which it may be needed.

From the bars, *d*, the current is conducted to the pole changer, *e*; an exceedingly ingenious piece of mechanism. It consists of two iron cylinders, *f* and *g*, with rectangular notches cut in them, as shown, and insulated from each other by gutta percha. One of the bars, *d*, is brought in metallic connection with the cylinder, *g*, and the other with the cylinder, *f*, and as the cylinders revolve they are brought alternately in contact with the standard, *h*, and a corresponding standard upon the opposite side of the machine. These standards are connected with the wires, *i i*, which lead the electricity to the electrotyping bath, or wherever it may be required. The cylinders, *f* and *g*, revolve with the magnet, and are so arranged as to reverse the current at the proper time to send a current through the wires, *i i*, always in the same direction.

These machines have now been in constant operation for a long period, producing currents of electricity with no cost except that of the power required for the simple revolution of the magnetic wheel in air. With the currents thus generated all the known results of galvanic electricity have been produced—light, heat, the reduction of metals and their alloys, telegraph operations, decomposition of water, and all medicinal and chemical effects. The batteries in common use for the various purposes for which they are employed are not only expensive in their consumption of metal and acid, injurious from the deleterious gases which they evolve, and troublesome to keep in order, but they are constantly changing, deteriorating from the moment they are put in action until they exhaust themselves by saturation.

The radiating magnetic machines have none of the above-named difficulties, but, the inventor says, that they are always constant, the current being unchanged by any cause whatever. For deposition of metals, for chemical research, for the operations of the telegraph, for every purpose for which electric currents are now used in the arts and sciences these machines are believed to be superior to the ever perishing and changing galvanic battery.

The improved pole changer transmits all the impulses in the same direction without the occurrence of any fire or spark, the arrangement being such that the current is unbroken during the change from both directions to one. This feature is of great practical importance in the operation of magneto machines, for the spark cannot occur upon the pole changer without rapidly consuming the metals of which the pole changer or conductors are made, nor can such brake with fire occur without great loss of electric current.

The key board, so readily arranged, will be found by those who operate the machines for any purpose whatever, exceedingly convenient, any amount of volume or intensity within the range of the machine may readily be obtained, adapted to any given solution for metallic deposition, for chemical research, magnetism, &c.

The rings upon which the helices are mounted are so arranged that they may be readily removed, and the several spools replaced by other spools wound with any gage of wire desired for any purpose for which the machines may be required.

At the establishment at College Point, Long Island, where these machines are being manufactured, several of them are kept in constant operation, and for a long period are said to have produced results never before attained by either magneto machines or galvanic batteries. Copper in large quantities is constantly being deposited in electrotyping for maps, medallions, &c. Electroplating is also done on a very extensive scale.

Any information in regard to the machines may be had by inquiring of or addressing Conrad Poppenhusen or G. W. Schramm, No. 44 Cliff street, or of the inventor, G. W. Beardslee, at College Point, Queens county, Long Island. The machines are manufactured by these parties and sold at prices ranging from $5 to $500 apiece.

NOTES ON MILITARY AND NAVAL AFFAIRS

THE SITUATION.

No event of marked importance has transpired during the past week. Messrs. Slidell, Mason, McFarland and Eustis, have been received in Fort Warren with demonstrations of joy, and it is announced as the purpose of the government to put them under strict prison discipline, such as is now enforced upon Colonel Corcoran and other prisoners of war at present in the "Confederate States" jails.

Reinforcements have been sent to Port Royal, and other expeditions, under command of Generals Butler and Burnside, are about to depart for some unknown point on the southern coast, when other blows will be struck at the very heart of the enemy. Those terrible shells from the fleet are terrific in their effect, and it is alleged that the inhabitants of the southern seaboard have lost faith in the capabilities of their earthworks to resist the Federal navy, and are fleeing into the interior. The new naval expedition will be under command of Commodore Porter who inherits a good deal of pluck and capacity for fight. Our people have great faith in the navy. In addition to reinforcements south, troops are continually pouring into Washington and Kentucky, and it is the understood purpose of General McClellan to carry on a vigorous campaign during the winter. General Halleck is actively engaged in re-organizing the Western department with a view to a probable movement down the Mississippi. He has issued an order forbidding fugitive slaves from entering into any of the camps, on the ground that they act as spies, and convey valuable information to the enemy. Some of the newspapers are vexed at this order, but we see great force in it. A General is held to a strict accountability by these same newspapers for every blunder made in his department, and it is no more than fair that he should be allowed to adopt all such measures as will insure him against blunders and accidents and defeat. We think some of our newspapers had better attend to their own business a little more and let others alone. They have already damaged the cause of the country immensely by their imprudence, and it is high time that they should begin to behave themselves and show more wisdom and far less reckless zeal. These journals are watching all the time to see what's doing with the negro, not being willing to let his case work itself out in the process of time. Our commanding officers must be heartily supported by the people, or else the cause of the country will suffer defeat. We amuse ourselves over a petty quarrel between Jeff. Davis and one of his Generals, but are seemingly oblivious to the fact that we are continually in trouble with our commanding generals. These bickerings are disgraceful, and for ourselves we are heartily ashamed and tired of them.

A FIGHT AT FORT PICKENS.

As we go to press, accounts by southern papers are received of a fight at Fort Pickens, near Pensacola, Florida. The Norfolk *Day Book* says that dispatches from Richmond state that a cannonade took place on Saturday, Nov. 23d, between Fort Pickens and the frigates Niagara and Colorado on one side, and the rebel batteries of General Bragg on the other. The accounts are very confused and contradictory, and little can be known in regard to the affair until the arrival of more reliable intelligence.

Fort Pickens is a very strong position on the western extremity or point of Santa Rosa Island, on the eastern side of the mouth of the harbor, and is only approachable by land on one side. Owing to the openness of the country, which is but a barren bed of sand, a party attacking from that source would be very much exposed. When last heard from Capt. Brown, the commandant, had only 1,700 men, exclusive of the force on the blockading fleet, and it was thought that he would not commence hostilities before the arrival of reinforcements. It is possible, however, that these may have been forwarded in that portion of the naval expedition which continued beyond Port Royal. By our next issue we shall doubtless have the details of the affair.

MISCELLANEOUS.

The chaplains of the army are discussing whether they shall wear a uniform or not, which would denote their true character without connecting them with the officers whose avocation is bloodshed. It was suggested that a black sash be the distinguishing feature of the uniform, but the color met with universal disfavor, so blue was substituted, and a committee appointed to consider the matter.

Ex-Commodore Tatnall, who commanded the popgun fleet of the Confederates at Port Royal, owns a large amount of property at Sackett's Harbor, N. Y. Measures have been taken to confiscate his house and furniture there, which is estimated to be worth $15,000.

Col. Billy Wilson, in command of the Zouaves on Santa Rosa Island, complains that, while he is showing his scalp as usual on the Island the Confederates are exhibiting it in New Orleans. It troubles Billy to know how they got it without his knowledge.

The following figures show the amount of commissary stores consumed in one month by the United States army of 500,000 men :—11,250,000 pounds of pork, or 18,750,000 pounds of fresh beef; 105,380 barrels of flour; 37,500 bushels of beans, or 1,500,000 pounds of rice; 1,600,000 pounds of coffee; 2,250,000 pounds of sugar; 150,000 gallons of vinegar; 225,000 pounds of candles; 600,000 pounds of soap; 9,384 bushels of salt, and 6,600,000 pounds of potatoes. It is said that the Union forces—regulars and volunteers—now in the pay of the government number 650,000, which would increase the consumption of the above articles three-twelfths.

The stone fleet has just sailed from New London, Conn. Twelve or fifteen vessels, all bound South, were laden with stones. The craft were old whalers. The fleet is to be joined outside by a like one from New Bedford, which will make the whole number of the vessels about thirty. Six thousand dollars each have been paid by the government for some of the best of these vessels. In the bottom of each ship a hole was bored, into which was fitted a lead pipe five inches in diameter, with a valve so fixed that, though perfectly safe even for a long voyage, it can be very quickly removed. It is calculated that the ship will be be filled and sunk to the bottom in twenty minutes after the removal of this valve. To provide against accidental jamming of the valves, each vessel is furnished with two augurs of the proper size.

The provisional State government of North Carolina, the establishment of which has been in contemplation for months past, was formally instituted at Hatteras inlet, on the 18th inst., by a convention of delegates and proxies representing, it is said, forty-five counties (more than half) of the State. The convention then adjourned, subject to the call of the President. Governor Taylor has issued a proclamation ordering a congressional election in the second district on the 27th ult.

Salt, an article of prime necessity, is getting very scarce throughout the South. We have the authority of a Southern paper for saying that it is advancing in price at the rate of $1 per day per sack. Professor Thomassey is at work in Charleston trying to make salt, and assures the *Mercury* that it is no joke to make salt, but hopes to have a supply ready about Christmas.

A Virginia paper says :—"Eggs are selling out in Iowa at one cent per dozen—here they sell for twenty-five cents. There corn can be readily bought at fifteen cents per bushel—here it is worth seventy-five to eighty cents; there apples sell for twenty-five cents per barrel—here money can hardly buy a bushel; there flour is worth four dollars a barrel—here it is worth from seven to eight or nine dollars; there salt is selling for one dollar and a half per sack—here at fifteen dollars. But these are only a few of the effects of the war and the blockade."

In the engagement at Port Royal, three of the principal officers in the Union forces were South Carolinians. Charles Steedman, of the Bienville; Percival Drayton, of the Pawnee, who was fighting against his own brother, Gen. Drayton, and John P. Bankhead, of the Pembina. This does not look as if the South were united in this attempt to destroy the Union.

Several persons suspected of intending to burn the the New Jersey railroad bridge over Elizabeth Creek, N. J., have been arrested. This is the second time that suspicious characters have been found prowling about the bridge at night, and both times have been periods when soldiers were about crossing along the line of the road.

By looking at your maps of Virginia you will notice that the counties of Accomack and Northampton are tacked on to the lower extremity of Maryland, forming a sort of handle to that State. There were armed bands of secessionists in those counties who were terrifying the Union men to such an extent as to require notice. Gen. Lockwood, of Delaware, at the head of 5,000 Union troops has repossessed those counties without bloodshed, the secessionists laying down their arms on his approach. Several cannon were captured, and an earthwork mounting several guns was found deserted.

Our readers will recollect that some time ago a correspondent wrote a letter to the SCIENTIFIC AMERICAN, describing the effects of a few nights' snooze under a blanket made of certain newspapers. Soldiers will find the use of paper, between their garments, very serviceable in protecting the body in cold weather. It is warmer than cloth, owing to its close texture.

Kentucky has now furnished to the government her full quota of the half million of men called for the national defence, and proposes to raise as many more for State service until the Confederate armies are driven from her soil. The situation of affairs in this State is represented as being very hopeful. The Union forces under General Buell are rapidly increasing, and it is believed that active aggressive movements will soon be made against the enemy—who has really but a small foothold in the State—where he is strongly intrenched.

The War Department is now receiving muskets, rifles and equipments in abundance by every steamer. The supply is fully equal to the immediate demand, and with those to arrive will be sufficient to equip the entire army and have a residue.

An army correspondent gives the following account of the medicine given the volunteers :—"Our doctors give us the same medicine for all complaints. Headache, blue pill; bellyache, blue pill; rheumatism, blue pill; yellow jaundice, blue pill; cold, blue pill; diarrhea, blue pill; and so on. We are decidedly the blue pill regiment, and of the opinion it don't take much to make a doctor."

Charles Frederick Havelock of England, brother to the brave General Havelock of East Indian fame, has been appointed on the staff of General McClellan in rank of Colonel, and is detailed to the position of Inspector of Cavalry.

It has been officially ascertained that the government has now in the field, in camp and in process of formation, six hundred thousand volunteers, and the enlistment for the regular service is more numerous than heretofore.

It is reported from Richmond that the Confederate government is once more on wheels. Jeff. Davis and his Cabinet of conspirators, were at last accounts on their way to Nashville, Tennessee. In his recent message to the Confederate Congress he urges the importance of building forty miles of railroad to connect an internal route to the South, fearing evidently that the Federal troops may seize the Atlantic and southwestern lines, thus cutting off all retreat by railroad from Richmond.

It is reported, with how much truth we know not, that out of 1,000 troops stationed at Toronto, Canada, more than 600 have deserted, the majority of whom found their way across the border to join the Union volunteers. It is believed that nearly 2,000 regular English troops are now enrolled in the ranks of our army.

Mittens for soldiers can be made out of cloth of cast-off clothing. With the aid of the sewing machine they can thus be supplied in great abundance. We remember well that our good mother used to make such mittens for us, and they were warm and comfortable. They should be well lined either with heavy cotton drilling or cotton flannel.

Captain Dahlgren and his Scientific Skill.

The *Evening Post* of this city pays a very high and deserved tribute to Capt. John A. Dahlgren, Commander of the United States Navy Yard at Washington. It says :—

The names of Dupont and his brave and loyal subordinates will be shouted through the land and proclaimed in votes of Congress as they deserve ; and the name of Dahlgren, to whose science and skill the success of courage and loyalty was in a great measure owing, should receive honorable mention too.

It is now thirty-five years since Paixhan made his first experiments in the use of shell guns, and to the perfection to which they have been carried, and to which the efficacy of our fire at Port Royal was due, no man has contributed so largely as Commander Dahlgren of the United States Navy. The most profound study, the most careful experiments, continued almost to this very day, have made the Dahlgren-Paixhan as nearly perfect as the laws of matter permit a smooth-bore gun to be ; and the untiring energy, the scientific knowledge and mechanical nicety which the Commander of the Washington Navy Yard has expended in this work, no man but an ordnance constructor can fully appreciate.

This problem was scarcely solved ere the rebellion made need for its results. Captain Dahlgren has since bent all his energies to the solution of the new problem of rifled guns, and with such success that, already, with his muzzle-loading gun and an expanding ball, he has attained nine-tenths of the accuracy of the Armstrong gun (the standard in this respect), with a rapidity of loading many times greater and with none of its structural objections. To this end new experiments had to be made, new tests and trials of the strength of materials and proportions of guns, and if at this moment our national foundries are turning out hundreds of rifled navy guns of first-rate construction, it is because the genius and accumulated knowledge of Dahlgren has buoyed out the channel to success and saved the country from the long and costly experience of improving our artillery under fire. If our gunnery answers to the demand for excellence, it is as much because Dahlgren has studied as because Dupont has disciplined.

But Dahlgren is as gallant as learned, and the warrior in him chafes as much at being kept out of the smoke of battle, as in the youngest hot blood in the navy. We happen to know that he is as anxious to be ordered to active service as any one of his fellow sailors, and in view of the chances of his peers afloat, is indifferent to his proper fame, earnestly desiring and urging to be ordered to active service.

Yet who is willing that he should put his life at the hazard of a cannonade, or that a chance ball should not only silence the voice of a brave captain, but still the brain of of one of our ablest and most valuable mechanicians—one whose knowledge quadruples the strength of our navy arm? But honor is the soul of the service, and it is the duty of the press and the people to look to it that he who silently prepares the material without which such achievements as the capture of Port Royal would be impossible, does not suffer from neglect, but gets a share of the honor, and of promotion in its proper course.

A Shaky War Vessel.—The London *Times* of Nov. 8th, states that the British steam frigate *Emerald*, of 51 guns, which was sent out to Halifax on the previous month, had put back in a sinking condition. She had been thoroughly caulked before departing, but this seemed to be of little benefit as her seams opened when she got into a rough sea, and she leaked like a sieve. The beams and knees of the lower deck parted, the pumps were broken, the discharge pipe of the engine split, and she became disabled for several days. What a miserable ship of war !

Hemp-flax rope machinery is manufactured by Messrs. Todd and Rafferty, at Paterson, N. J., as will be perceived by reference to their advertisement in this paper. This firm have had large experience in this business, and are reliable and excellent manufacturers.

Is the Blockade Effectual?

Considerable irritation has been shown by a portion of the English press in reference to the blockade of the southern ports. They have gone so far as to insist that the blockade was ineffectual, and therefore, according to the law of nations, not to be respected. Now the truth is that the blockade is so effectual that all trade and commerce with the southern ports is almost entirely cut off, and almost every article of necessity is to be obtained only at exorbitant prices, and as for the export of cotton from the southern ports, not a bale has yet escaped the blockade so far as we have authentic advices. If our English cotemporaries desire satisfactory testimony on this subject, let them peruse the following quotation from a recent number of the New Orleans *Crescent*. It says :—

The heretofore magic word 'cotton is scarcely lisped now-a-days on the flags. Some parties—would-be operators—hope that the blockade may be broken or raised, but hoping will not effect it. It is manifest that Great Britain will adhere to the opinion she assumed months ago—a strict neutrality. There has been much talk and a great many comments on what has been termed running the blockade.

Reports—and they will prove to be simply reports—say that 516 vessels have run the blockade since the 16th of May last. This is a very wild estimate, even if it is supported by returns or statements in the departments at Richmond. The blockade was enforced off the mouths of the Mississippi river on the 25th of May, at which time there were forty-sail of vessels in this port outward bound which were permitted to go to sea. The blockade commenced off Mobile and Pensacola about the same time. Vessels were allowed to leave these ports till the 8th of June.

So far as New Orleans is to be considered, the last arrivals *via* the Balize, were on the 29th of May last. There have been some arrivals and departure of schooners from the bayous on the Gulf. There have been some coasting vessels on the coast of Carolina evading the blockade ; but all these will not count up 516. On the other hand, the Hessian steamer *South Carolina*, has captured seventeen schooners in attempting to run the gauntlet between New Orleans and Texas ports. There have been only three or four vessels from Europe—one the *Bermuda*—that have successfully run the blockade.

Some few West India traders have met with success on the Carolina coast. *It is misleading foreign governments to make assertions of this character, that the blockade is easily avoided, when not a vessel has entered the port of New Orleans via the river for over five months ; and only one via the Lakes from a foreign port.* Great Britain and France recognize the closing of our ports whether it is effectual or ineffectual. It is, however, thought the steamer *Nashville*, has got out of the port of Charleston, and gone somewhere. It is also evident that the steamers *Theodore*, or *Gordon*, made a successful trip from that port to Cuba and back.

We trust that in view of such testimony as this, that we shall hear no more complaints from England of an ineffectual blockade.

Experiments with Ammunition.

The Philadelphia *Press* thus describes some interesting experiments with ammunition made at the Bridesburg Arsenal, near that city :—

A new fuse-driving machine has been placed in the apartment hitherto appropriated exclusively for the manufacture of percussion caps. It arrived at the arsenal but a few days since from the Washington navy yard. It is somewhat novel in character, and has been quite recently devised.

Substantially, it consists of a vertical screw steadied and directed by a shoulder through which it passes. At its upper end it fits into a horizontal brass disk, about two feet in diameter. Four "spokes" or handles are disposed around the rim of the disk at equidistant points. About eighteen inches below the lower extremity of the screw a revolvable bed-plate is placed. Upon this two vertical brass cylinders are placed, which receive the paper fuse covers.

The mode of operation is then as follows, two persons being required to the machine :—One of the operators places himself immediately opposite the bed-place, and placing a paper fuse cover within one of the cylinders, pours into it a "charge," consisting of two or three scruples of powder. His assistant then causes the brass disk to revolve by means of the handles, and the screw descending upon a movable steel punch, the latter rams the charge.

When the proper pressure is reached (and it may readily be regulated to the required number of pounds), a signal bell is struck, and the revolution of the disk checked by a spring. A second charge is then inserted, and the process repeated. The greatest pressure attainable on the machine at any one time is 426 pounds.

The fuses now being made at the arsenal (which are intended for the Phœnixville rifled-cannon projectiles) will burn precisely eleven seconds. One of them was yesterday tested for the first time.

Being screwed firmly in the jaws of a vise a bar of iron heated to a cherry red was applied to it. Instantly a flame shot up to a hight of three inches, assuming a whitish-yellow hue, except around its base and lower edges, where the color alternated from blue to violet. It burned with all the violence of a flame produced by an oxyhydrogen blowpipe, and was accompanied by a very perceptible hissing sound. As the combustion progressed, this sound became more and more audible, and its termination was marked by a sort of sibillant puff and the ascension of an unpleasantly odorous column of smoke. The cover of the fuse, strange to say, was not destroyed.

These fumes are composed simply of meal-powder and sulphur. The former ingredient will burn precisely two seconds to the inch, while a composition of one part of sulphur and two of meal-powder burns just five seconds to the inch. To increase the time of combustion, as when long ranges are desired, a greater proportion of sulphur must be added. We learn that sixty thousand fuses are to be made at the arsenal.

It has been shrewdly surmised that the delay of our army to make a forward movement in Virginia has rather been occasioned by the lack of artillery than by any indisposition to incur the attendant risk of any such movement. As is well known, the Phœnix Iron Company is now engaged in filling a contract with the government for three hundred 3-inch guns. Immediately upon their completion, our army will be in a condition to make an aggressive move with every prospect of success.

The projectiles to be used with these guns are oblong shells, the casting of which in sufficient quantities will, perhaps, require months. The first installment will be received at the arsenal in the early part of next week.

Export of Grain to Europe.

In 1860, from the 1st of January to the 1st of November, the exports of grain were as follows :—

Wheat, bushels	9,112,306
Corn	2,356,012
Oats	102,134
Rye	450
Barley	8,280
Total, bushels	11,579,182

The exports this year in the same period of time have been :—

Wheat, bushels	20,413,031
Corn	9,935,474
Oats	148,419
Rye	604,937
Barley	1,000
Total, bushels	31,102,861

These exports of wheat have been more than double those in 1860, and over two hundred times those of 1859. The proportion of corn has been one bushel in 1859 to fifty-seven in 1861, and one bushel in 1860 to four in 1861.

The Smithsonian Institution

We have received from Hon. S. S. Cox, of Ohio, the annual report of the Board of Regents of the Smithsonian Institution, showing the operations, expenditures, and condition of the Institution for the year 1860. The whole amount of Smithson's bequest deposited in the Treasury of the United States, is $515,169, from which an annual income, at six per cent, is derived of $30,910,14. The expenditures have been kept below the receipts and a surplus fund of $141,100 has been accumulated. This is invested principally in Indiana, Virginia and Tennessee stocks and has yielded an annual income of $7,716. The principal portion of this is expended for publications, researches, lectures, library, museum, and gallery of art.

Patent Office Reports Burned.—One of the government binderies at Washington was burned on the 25th ult., destroying 40,000 volumes of the second volume of Patent Office Reports, composed solely of engravings. Quite a number of Maj. Delafield's valuable military report, together with several thousand dollars worth of bindery materials, were destroyed. The loss to the government will be about twenty thousand dollars, though it is estimated much higher just now.

A large steamer has lately been built at Liverpool, England, with the steam jet applied to the chimney as it is in locomotives, for the purpose of increasing the draft. It has been partially successful.

THE GEOLOGICAL HISTORY OF NORTH AMERICA.

BY DR. STEVENS.

Fourth Lecture.

How long the molluscan era of the earth continued, in which the Siberian seas swept around the verdureless islands and boreal continents, now united to form the North American continent, we have no means for measurement; sufficiently long, however, for the broad bosom of the seas to be filled up with immense deposits of limestones, known as the Trenton, magnesian, Galena and blue limestone, in different parts of our country; for equally immense deposits of shales, known as the Hudson river, Utica slates, and black slates of the West, and for the gypsum and salt-bearing rocks of New York.

As the era drew near to its close and a new animal kingdom was about to be introduced, a vast deposit of sand was brought by some unknown causes into the bottom of the seas, the currents bearing it sweeping from the east westward. These sands blotted out the life of the old seas, obliterating the past and preparing for the future. These sands are now known as the Oriskany sandstone in New York, and forming a range of Mountains in Pennsylvania and Virginia. They lie at the base of the new, the fish era, or Devonian age, which is the subject of the lecture this evening.

This map shows you what may have been the shape and dimensions of the Devonian and carboniferous continent of the then western world—at least of such portions of it as have been preserved to us from amid the wreck of continents and the crash of worlds. You perceive that since the primitive or azoic, it has vastly increased, but still preserving its triangular form, growing toward the equator. A remarkable feature of it is the absence of lofty mountain ranges, and consequently of an extended river system, for without mountains to condense the evaporated moisture from the seas, there can be no springs or perennial sources of flowing water. Into the seas that surrounded the dry land were introduced an entirely new population of shellfish with an order of fish, designated by Agassiz as the *Ganoid*, or those fish having thick, bony plates for scales, covering the body from the head to the elongated tail, serving the double purpose of a buckler for defense and covering for the muscular system. No higher order of the animal kingdom was known, and hence the name of the fish era to this age of the earth. Of this great order of fish, once so abundant in the seas, only two species have come down to the present—the gar pike of our western waters, and the other of the Nile in Africa.

We first find their bones, teeth and scaly plates in the limestones at the base of the system, which, in our country, underlie the Cattskill mountains, and are found along the western shores of Lake Erie and again at the Falls of the Ohio. The great receptacle of the remains of the fish, however, is in the old red sandstone system which caps the Cattskill mountains and the lofty hills in north-eastern Pennsylvania. These cemeteries of the dead have been industriously worked by the Scotch geologists, and made classical ground by Miller and Anderson.

The predominance of fish as the highest type of life in the seas, continued through all of the coal era, or carboniferous age. Indeed, as this may be considered as but another chapter of this history, we shall so treat it this evening.

The Devonian continent gradually grew into the carboniferous. Land plants appeared in the former, few in species and sparsely distributed; in the latter, flourishing in the most abundant profusion and luxuriant foliage and verdure. In this cartoon you see a sample of three genera of the three vegetable kingdoms. This one, with jointed column, fluted longitudinally, is called the *calamites*, and was the gigantic representative of the scouring rush of sandy and damp lands. This one, with lofty stem and umbelliferous top, is now known as the lowly fern tree, to be seen only in some collection of exotic plants. The other, with ten or more leaves surrounding the stalk, is also a lofty representative of the fern family.

It is seldom that we find in the rocks well-preserved specimens of entire individual trees. They have come down to us in fragments, and the botany of the continents has to be studied on fragmentary sheets of preserved specimens and not in well-printed and carefully-illustrated editions. Enough, however, is known of the profusion of species at the period we are speaking of to understand that the forests were variegated in appearance, rich in profusion of species, and that lofty trees were loaded with fruit, and rich and costly gums exuded from the broken branches. That the savannas were green with ferns and mosses, that the air was laden with the aroma of flowers, and that the insects came home loaded with pollen and the mellifluous fruits of their aerial journeys.

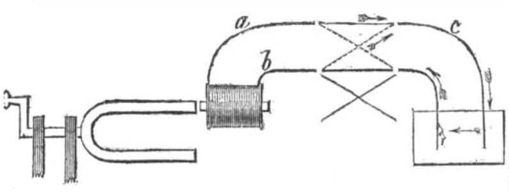
The minerals of this age are galena, copper ores and zinc blende, found in the limestones at the base of the carboniferous, the galena becoming in the West and Southeast a silver-bearing ore. Iron ore, as a carbonate, and known as kidney ore, clay ore and various other synonyms, is diagnostic of this age. Coal in various forms is also diagnostic.

This section will show the order and arrangement of the various minerals of this age better than any extended description.

Pittsburgh series,	Coal, Clay, Shale, Coal, Clay, Shale, Coal, Clay, Limestone.	These are commonly known as the upper coal.
Barren Measures,	Shales and Sandstone.	Several hundred feet of strata which do not contain coal.
Ohio System,	Shale, Blackband Ore, Coal, Clay, Sandstone, Coal, Clay, K. Ore, Coal, Clay, Shale, Oolite Ore, Sandstone, Limestone, Coal, Clay, Shale, Limestone, Cannel Coal, Clay, Sandstone, Shale, Coal, Clay, Conglomerate Rock.	These strata vary in different localities; the shale in one will be loaded with iron, in another having but very little; limestones will run out; sandstones will be thicker, and coal veins will disappear.
Sub-Carboniferous of the West,	Shale, Limestone, Sandstone, Shale, Limestone, Sandstone.	These limestones in Missouri, New Mexico, the Indian country and Mexico, are lead and silver rocks having fish remains.
Devonian,	Sandstone, Shale, Carbonate Iron Ore.	Upper Devonian of Pennsylvania and N. Y., with fish remains.

MAGNETIC ELECTRICITY.

The fundamental facts of magnetic electricity are few and simple. If a permanent steel magnet is brought near a piece of iron, the iron is converted into



a magnet, and on the withdrawal of the steel magnet the iron loses its magnetism. If the iron is wound spirally with a piece of insulated wire, as the magnet is brought near the iron of the spiral or helix, a wave of electricity goes through the helical wire. This wave is momentary, the current instantly ceasing, and no further manifestation of electricity is made as long as the iron core remains magnetic. But on the withdrawal of the permanent magnet, and the consequent destruction of magnetism in the iron core, another wave of electricity passes through the helical wire in the opposite direction to the first. When the north pole of the magnet is brought near the iron core of the helix, the current is in one direction; and when the south pole is approached, the current is in the opposite direction. Thus the current induced by the approach of the south pole is in the same direction as that caused by the withdrawal of the north pole.

Magneto-electric machines are made with a magnet to revolve as close as possible to the end of an iron core of a helix, and each revolution produces four waves of electricity through the helical wire, two on the approach and withdrawal of each pole.

One half of the time the electricity is going out of the end, *a*, of the helical wire, and the other half out of the end, *b*.

In electro-plating, the metal is deposited upon the plate through which the current leaves the bath. Hence, in electro-plating with a magneto-electric machine one half of the current would be lost unless its direction could be changed at each passage of the magnet past the end of the core of the helix. This is easily done by bringing the wire, *c*, alternately in contact with the wires, *a* and *b*, the contact being made with each wire at the time the current is passing out through it. Many mechanical devices have been employed for changing the direction of the current, and they have received the technical name of pole changers. One of the simplest is represented in the cut. It consists of one pair of parallel wires to be introduced to complete the circuit while the current is passing out through *a*, and a pair of cross wires to be introduced to complete the circuit while the current is passing out through *b*. A glance at the cut will show that this causes the current to pass constantly in the same direction through the bath, though its direction through the wires, *a* and *b*, is frequently being reversed. Any simple mechanism may be employed to introduce alternately the pair of cross wires and the pair of parallel wires.

Electricity, like heat, varies in intensity. A hogshead full of boiling water contains a large quantity of heat, though the heat is not very intense; on the other hand, the jet of a compound blow-pipe is intensely hot though the quantity of heat is small. Electricity varies in the same way in its relative quantity and intensity. In magneto-electrical machines in which a number of helices are employed it is found that the intensity of the electricity is increased by connecting the wire of one halix with that of another in a way to pass the current through several helices in succession, while the quantity is increased by bringing the several wires together in one bundle and uniting thus the currents of all.

These fundamental facts will enable any one who has not made a study of magneto-electricity to understand the beautiful electro-magnetic machine illustrated on another page.

The Armstrong Gun.

The London *Engineer* says:—We shall have greatly mistaken if we are not now near deliverance from the five years' delusion of the so-called "Armstrong gun." In actual range it has been exceeded by Mr. Lynal Thomas's rifled gun; in penetrative power at short range it is notoriously inferior to the ordinary cast-iron service guns, throwing a projectile of even less weight; in cost it is very far more expensive than any other gun, even when made of bronze or of steel, and in the essential qualities of reliability in action it would appear, from all the experiments that have been made, that it is inferior to any and every gun yet produced. As for great range, say beyond three miles, there is no advantage that any one can assign. But even if ten-mile ranges were desirable, it would require only that the gun employed should be able to withstand proportionate charges of powder, exploded behind long projectiles of comparatively small diameter. Given, an unburstable gun and almost any range under twenty or thirty miles would be practicable. Long range, with a given form and weight of projectile, is solely, however, a question of so many pounds of powder and of the strength of the gun. Powder is so cheap that, so far as its cost is alone concerned, it is almost immaterial what quantity be used, and as for the other and far more important condition—strength of gun—it is sufficiently known that the Armstrong gun in no way approaches to the greatest practicable strength. Captain Halsted, in a letter to the *Times*, states that the *Stork* gunboat has had no less than four 100 ℔. "Armstrong" guns in succession, the first, second, and third having failed, one after the other.

To Remove Clinkers from Stoves.

Some kinds of coal are liable to form clinkers which adhere to the fire-brick lining of stoves, grates and furnaces, and become a source of great annoyance, as they cannot be removed by usual means without breaking the firebrick. Persons who are thus annoyed will be glad to know that by putting a few oyster shells in the fire close to the clinkers, the latter will become so loose as to be readily removed without breaking the lining. On page 37, Vol. II. (new series) of the Scientific American, we published this receipt, and since that time it has been tried and its utility endorsed by several persons.

CHEMISTRY OF IRON.

Number VI.

NATIVE LODESTONE.

In ancient Greece, among the shepherds who tended their flocks upon the sides of Mount Ida, was an observing man by the name of Magnes. He noticed that a certain black stone adhered to the iron of his crook, and making known his discovery the stone was called magnet, after the name of the discover, which was thus made immortal. The mineral has been called also the native lodestone, but it is known to modern chemistry as the magnetic oxide of iron.

We have described two oxides of iron. The atom of one is formed by the combination of one atom of iron (*ferrum*) with one atom of oxygen, Fe O ; this is the protoxide of iron. The other is formed by the combination of two atoms of iron with three of oxygen, $Fe_2 O_3$, and is called the sesquioxide of iron. The atom of the magnetic oxide of iron is formed by a combination of one atom of the protoxide with one atom of the sesquioxide, $Fe O + Fe_2 O_3$, or it may be written $Fe_3 O_4$. As the oxygen atom weighs 8 and the iron atom 28, the proportion of iron in pure magnetic oxide of iron would be 84 pounds of iron to 116 pounds of the ore.

The magnetic oxide is one of the best of the iron ores. The famous Swedish iron is made from this ore, and Iron Mountain in Missouri is formed of it. Those of our readers who are following Dr. Stevens in his exceedingly interesting history of the geology of this continent, will remember that magnetic iron ore is found only in the azoic rocks, those that existed before the creation of life upon the earth. As this ore will attract iron, while none of the other oxides of iron will, it is very easily distinguished; and it is very easy by its means to determine the age of the geological formation in which it is found. The scales which fly from wrought iron while it is being forged, are the magnetic oxide of iron.

HARDENING AND TEMPERING TOOLS AND METALS.

Number I.

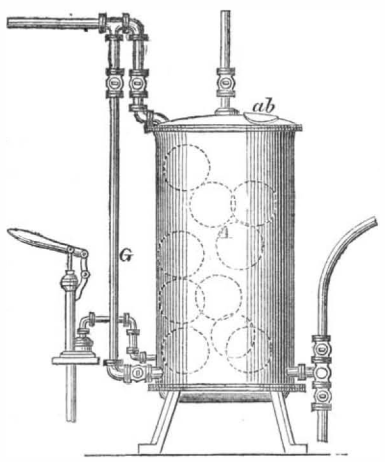
Steel possesses the property of becoming exceedingly hard by being highly heated, then suddenly cooled. The higher the temperature to which this metal is raised, and the colder the solution into which it is suddenly plunged, the harder it becomes. The temper of a tool or piece of steel means that degree of hardness and tenacity which it possesses. Steel is usually hardened by raising it to a red heat in a clear fire, or in molten metal, such as lead, then plunging it either into cold water, cold salt brine, or a cold oil bath. By this treatment it is not only made hard, but very brittle. Tempering consists in removing this brittleness and this process succeeds that of hardening. It is based upon another property which steel possesses, namely, becoming soft and tough again when subjected to heat. In proportion as the heat is gradually increased, the brittleness diminishes, and when it is reduced to the proper degree of hardness required for the instrument it is again cooled. The proper degree of hardness is ascertained by the color which the surface of the tool or metal assumes when being heated in the open atmosphere. When great elasticity is desired for steel, such as in springs for watches, locks, &c., it is cooled as soon as it has assumed a blue color. The following table gives the color and temperature required for the temper of different instruments and tools :—

1. Pale straw color, 430° Fah. for lancets (hard.)
2. Dark yellow, 450° Fah. for razors.
3. Dark straw, 470° Fah. for penknives.
4. Clay yellow, 490° Fah. for chisels and shears.
5. Brown yellow, 500° Fah. for axes and plane-irons
6. Very pale purple, 520° Fah. for table-knives.
7. Light purple, 530° Fah. for swords and watch-springs.
8. Dark purple, 550° Fah. for softer swords and watch-springs.
9. Dark blue, 570° Fah. for small fine saws.
10. Blue, 590° Fah. for large saws.
11. Pale Blue, 610° Fah. for saws, the teeth of which are set with pliers.
12. Greenish blue, 630° Fah. for very soft temper.

It is a remarkable fact that hammered iron does not become hard like steel by heating and cooling. Most of the metals and their alloys are unaffected by heating and cooling so far as they relate to hardness and temper. Steel alone possesses the hardening and tempering properties in an eminent degree. By hammering and rolling steel cold it increases in hardness and elasticity up to a certain point, but after this has been reached the action must be stopped or the metal will become very brittle. The hardening and rolling seem to produce the tempering effects by forcing the grains of the metal closer together. Some kinds of steel springs and saws are treated by the hammer-hardening process. A large circular steel saw being raised to a red heat is laid down upon a circular steel, faced anvil secured upon a solid bed of masonry, and a heavy hammer shaped like a cheese, weighing several tuns, is tripped and falls down upon it with a tremendous blow. The saw is kept under the weight until it cools. Large saws which are hardened by plunging them when red hot into a mixture of oil and resin, are generally tempered by subsequent hammering.

TESTING BOILER WATER GAGES.

A hollow float, such as a thin copper globe placed in a steam boiler and connected with a lever to a steam valve, makes a safety water gage. The hollow

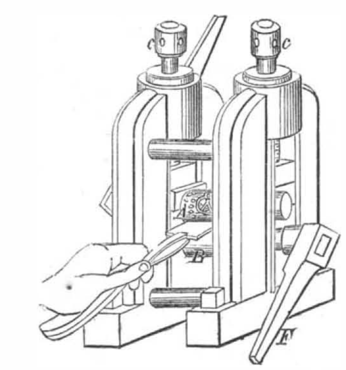


sphere rises and falls with the water, and when it drops below the fire-line, the lever opens the safety-valve and gives the alarm. The globe may also be connected with the valve of a water reservoir, which may be made to operate as a self-acting boiler feeder. It has been difficult to obtain reliable floats of this character—such as would stand the heat and pressure of a boiler—hence they have been used to a very limited extent. The accompanying figure represents a method of testing such hollow spheres to ascertain which are reliable, so that such alone may be employed. A is a close strong cylinder having a number of spheres in it to be tested.

It has a pipe, G, connected with a steam boiler ; also an exit pipe, and there is a Bramah pump situated at one side. In this manner the hollow spheres can be submitted to any degree of steam heat and water pressure. The spheres are put in and taken out at *a b*. Patented by G. W. Lane, Boston, Mass., March 13, 1860.

EMBOSSING DESIGNS ON METALS.

Steel can be rendered as safe as copper by covering it with sand and submitting it to a red heat for several days in a properly constructed furnace. Steel rollers



for embossing are thus treated, then they are engraved, and afterward hardened. They are then capable of impressing the design that is engraved upon them, upon all softer metals and it is thus they are employed as represented by the accompanying figure. A is a steel roller with the design engraved upon it, and B is the under roller with the lever F, for pressing the article to be embossed against the design. A strip of gold intended for a bracelet is shown as being placed under the design roller, and by bringing the two in contact under great pressure with the lever, the design is transferred in the reverse upon the sheet of gold. It is thus that an endless variety of beautiful designs can be quickly impressed upon such articles by this simple operation. The screws, *c c*, are for the purpose of regulating the pressure. The art of manufacturing such rollers has been carried to great perfection by our mechanicians. A Waterbury manufacturer has recently furnished such rollers to the banks of France and England. Our engraving represents a plan patented by W. Riker, of Newark, N. J., on the March 13, 1860.

Colored Liquids.

Solutions of some salts and metals in hydrochloric acid give colors of very great intensity and beauty. Thus, a yellow liquid is obtained by dissolving 3 parts of perchloride of iron, or hydrated peroxide in 100 of hydrochloric acid : the color may be hightened by adding some hydrated oxide. Various colors are produced with the solution of protocarbonate of cobalt in hydrochloric acid. The salt of cobalt used, must be chemically pure, especially free from iron or nickel, which would prevent or neutralize the formation of the blue and red shade. The green cobalt color is obtained by dissolving three parts of the protocarbonate in 100 parts of the acid, and filtering. By the addition of a few drops of the above yellow liquid, the color is deepened, and loses its bluish tinge. A blue color is prepared by dissolving 6 parts of the protocarbonate of cobalt in 100 parts of the acid and boiling for about two minutes to remove the carbonic acid or chlorine held in solution. Neither of the above two colors should be diluted with water, as this would change them to red. The violet color is obtained by dissolving 34 parts of the protocarbonate of cobalt in 100 parts of the acid, mixed with 5 of water, and boiling up before filtering. A very fine red liquid is obtained by dissolving 45 parts of the protocarbonate of cobalt to 100 parts of acid, diluting with 45 parts of water, and boiling. All the cobalt colors change by heating the solutions, which gives them more or less a blue tinge ; a solution of carbonate of chromium in hydrochloric acid (chloride of chromium), evaporated until it becomes hard on cooling, and dissolved in alcohol (90 per cent) in the proportion of 25 parts of the salt and 100 of the spirit (to which are added 5 parts of acid), furnishes a fine deep green. Four parts of crystallized acetate of copper dissolved in a mixture of 50 parts of aqua ammonia and 50 of 90 per cent alcohol, give a durable blue.

Gold for Jewelry.

Pure gold is not used for jewelry ; but is usually alloyed by introducing a small quantity of silver or copper. Silver renders it lighter in color, and copper gives it a deeper shade, inclining it to a reddish hue. The jeweller of the present day relies in a great measure on dies for the forms he gives the articles that come from his hand. These he has cut in steel with care, and many of them are beautiful, and often very intricate. The gold is rolled out into strips, and what is beheld is all that it professes to be—pure gold ; but the proportion of the metal to the whole is very small. A strip of gold, not thicker than a silver dollar, is secured to a bar of brass of corresponding size, but much thicker in proportion. A flux is applied, to unite the two, and the mass is subjected to the action of the fire. At the proper moment it is withdrawn, and when cool the two metals are found firmly united. The bar is then rolled out between steel rollers till the metal in the form of a long ribbon, is not thicker than letter paper. It is then cut into small pieces of the size required, and the artizan so places them in succession that the die falls upon each in turn, giving it the required form.

SIR HOWARD DOUGLASS.—This military author died in London, on the 8th ult. He was an officer in the British army, and a member of Parliament, but it is as a writer on military subjects that he is best known. His treatise on naval gunnery is allowed to be a standard work, and he is quoted as good authority by all military men in questions relating to military engineering.

Correspondence

Suggestions about Flying—The Thing Accomplished.

MESSRS. EDITORS:—Allow me to say a few words in the columns of your excellent journal upon a subject to which I have devoted years of attention, and finally with the most satisfactory results. I refer to the navigation of the atmosphere.

Since the creation of the earth, men have longed to "take to themselves wings and soar away" like the birds of the air. The thirst for amusement, for knowledge, for novelty, for fame, for wealth, in fact, for almost every object that man holds dear has conspired to incite inventors to exertion in this particular field. Especially has the almost boundless wealth which would be the reward of the successful inventor served as a powerful incentive to that proverbially poor class.

Yet, although inventive genius has accomplished results little short of miraculous in other directions, we have been, up to the present time, practically as far from the attainment of that desire as in the days of Adam. To be sure, we have the balloon, but that is a mere plaything, and, as is evident to all who have considered the subject, can never be anything more. The requisites of a serviceable "air ship" are, the ability to move in any direction, regardless of winds or currents of air, and, if need, to maintain a stationary position in the atmosphere at any place and for any required length of time.

In constructing such a machine there are three distinct points or departments of investigation and experiment to be followed up in order to attain perfection.

First, the shape and material of the hull or body of the vessel. This, although by no means arrived at as easily as might be supposed, is less difficult than—second, the construction of the propeller, or contrivance by whose action upon the atmosphere motion is given to the vessel; and, third, the motive power. This, in the absence of any specially adapted to the purpose might be supplied by some of those already known, but at a ruinous disadvantage, were it practicable.

I noticed, sometime ago, accounts of a new invention for navigating the air, called the Aeronef, by M. De Pouton, the inventor. It is said to have excited much discussion, and "made a great sensation," and yet all that has been done, admitting fully the claims of the inventor, is the elaboration or calculation of a method of propelling an air ship. *Vide* the following extract translated from *Le Mer*, by M. De La Landell:—". . . . This amounts to saying that the problem already solved by mechanical skill awaits only the aid of some sufficient physico-chemical force in order to attain a perfect development, and, Heaven be praised, the resources of modern science are of miraculous fecundity."

Moreover, if I read correctly, no working model has been constructed, although any amount of calculation and speculation was expended, and that is about all. Only one point of the three, therefore, has been solved, and that theoretically, the whole thing—the latest and best of which any account has been published—being practically valueless, as it is fair to infer that as no model was constructed there was reason for it, and that it is one of the many wonderful discoveries which continually startle us for a time and are never afterward heard of.

Four years ago I solved the very problem now said to have been solved by this Frenchman, and constructed a machine, worked by a strong spring, embodying my principles. Having fully satisfied myself, by repeated trials, of the practicability of my inventions in the first two points, I have since devoted my attention to the third, and have finally discovered a motive power, or "physico-chemical force," specially adapted to the purpose.

I do not propose to explain here the nature of my discoveries, for obvious reasons, but will state a few facts as to the operation of the model I made four years ago. I obtained a very powerful steel spring, which, by means of proper gear attached, furnished force for about two and a quarter minutes. The hull, including spring, &c., weighed 77 pounds, and I placed an extra weight upon it of 62 pounds. The machine was fastened at a distance of 30 feet to a strong post, so as to revolve freely around it. I made, at different times, about twenty-six trials, and, allowing a quarter of a minute to get well under way, I found as the average of these trials 94 revolutions in the two minutes. The greatest number was 117. Even under all the disadvantages of first trials, new machinery and other obvious drawbacks, we have here an average motion of 8,836 feet, or over one and a half miles per minute.

Calculation, confirmed by such experiments as I have been able to make, demonstrates that increase in the size of the propeller was attended by an increase in its power or effect upon the atmosphere in the proportion of two to three respectively, so that there is no doubt in my mind but that a speed of five miles a minute is easily attainable. The same power would sustain the whole weight in the atmosphere for the two and a quarter minutes, after the first three or four seconds.

It will therefore be seen that I have not only invented a flying machine, but made a working model, which operated in a manner eminently satisfactory—being, I think, the first on record.

Some further experiments will, probably, be necessary in making the different parts on a larger scale. I would then make a machine of full size for actual and practical service. But propellers and motive powers are not invented cheaply, and they have cost me my substance.

I need capital, and would call the attention of capitalists to this as an investment which it needs no second thought to show promises a splendid return. Its value is too obvious to need even to be pointed out.

If I cannot make a satisfactory arrangement here I shall proceed to France, not doubting of success there. Persons wishing to correspond, with a view to investment, can address immediately.

CHARLES F. EDWARDS.

The Question in Relation to Expansion.

MESSRS. EDITORS:—In the SCIENTIFIC AMERICAN for Nov. 2d, I observe an extract from Mr. McElroy's communication to the Franklin Institute, criticising the report of the Board of Naval Engineers on the steam experiments made at Erie, Pa., in which the writer says:—"This is the real matter at issue, whether it is cheaper to carry high steam and expand, or to carry low steam and follow at full stroke."

In your remarks upon the subject you corroborate Mr. McElroy's views, but from which I beg to differ. There can be no question as to the relative economy of high and low steam, as all engineers are agreed upon the matter, and practical men are able to estimate, pretty nearly, the per centage of saving for each pound increase in the pressure.

The real question appears to me to be, shall we put a cut-off or not upon our engines. The economy of high pressure steam we are all agreed upon. With your permission I would like to ask Mr. McElroy the following question:—

With a given amount of work to perform, is it better to put in a small cylinder, and let the steam follow the piston all the way, or put in a larger cylinder, and apply a cut-off, the boiler pressure being the same in both instances?

To illustrate my meaning more clearly, we will suppose we have to perform the work of forty-horse power. This would require say a fourteen-inch cylinder; piston to travel three hundred feet per minute, and say fifty pounds pressure per inch. The question now arises, is it better to put this size cylinder, and let the steam follow the stroke, or put a proportionably larger cylinder, say twenty or twenty-two inches, and cut-off at one-fourth, or one-third of the stroke?

I should be glad to have Mr. McElroy's opinion upon this. JOHN WEST.

Norristown, Pa., Nov. 14, 1861.

A Coal-Oil Fire Ship.

MESSRS. EDITORS:—Let me suggest an iron vessel of war of a novel but effective kind. Let a small but swift iron steamer be fitted up with a few close iron tanks containing petroleum in the hold so that its vapor could not take fire in the vessel. This oil could be pumped from the tanks through iron pipes, and by means of an engine like a fire engine worked by steam, the liquid could be thrown to a considerable distance. By setting fire to the stream as it issued from the pipe, the whole outer surface of the stream would burst into flame, and the vessel attacked would be deluged with a liquid fire equally deadly and inextinguishable with the famed Greek fire. By having a little phosphorus dissolved in the first few gallons of light naphtha thrown, it would inflame of itself, or a little could be thrown dissolved in the bisulphide of carbon, when the petroleum afterward thrown would inflame as a matter of course.

The petroleum might have sulphur dissolved in it to produce noxious vapors, if desirable. As this substance is now worth only about ten cents a gallon it would be cheap as well as effectual. Wooden ships would be speedily consumed, and iron ones could be speedily deluged with the liquid fire, and an open porthole would ensure destruction to the inmates. A vessel could be easily made to discharge the liquid with safety to the operators. In case of a foreign war, why may not the vast depositories of petroleum in Pennsylvania and Kanawha, be turned to account in this way. The heat given off by the substance would be intense, while the explosions of the light vapor on the edge of the stream, as it mixed with the atmosphere, and the dense black smoke surrounding the vessel attacked, would realize the most vivid descriptions of conflicts between the Crescent and Cross, when infidel fleets were burned, and the tide of conquest stayed 100 years by the lucky discovery and application of an inflammable fluid principally consisting of this very petroleum. C.

The Right Glass for Lamp Chimneys.

MESSRS. EDITORS:—In your paper of Nov. 23d, page 329, under the head of "Lamp Chimneys" you speak of a patent obtained by Mr. Bailey, of Wolverhampton, England, for glass chimneys made of bottle glass. Now the evil that you complain of in the common miserable chimneys furnished for oil lamps, is produced by the very article that is named as patented, namely, bottle glass. These miserable chimneys, which cost more than the oil, are made of bottle glass, technically called lime glass. The green bottle glass is made in the following proportions:—

Bottle Glass.—Sand, 100; soda ash, 33; lime, 18 to 20.

Lime Glass.—Sand, 100; soda ash, 36 to 40; lime, 20; niter, 4.

Lead Flint Glass.—Sand, 100; lead, 30 to 35; soda ash, 25 to 30; niter, 7 to 9.

The bottle glass has the green color imparted to it from being melted in open pots in the furnace, the whole of the material being exposed to the carbon of the fuel. The lime glass is melted in covered pots or crucibles, and by that means is like lead glass in appearance, but it does not stand heats and colds like the lead glass; all glass manufacturers know these facts, but some few of them, more especially around Pittsburgh, are making nothing else but lime-glass chimneys. They send them all over the country, and sell them by auction at half the price the lead-glass chimneys can be sold for. Some little dealers are taken in by the operation, others again, buy the articles knowingly, and sell them for good lead-glass chimneys, by which short-sighted and dishonest practice they destroy the business. I have experimented with the two kinds of chimneys, and have broken six lime-glass chimneys as quick as I could replace them on the lamp; with the lead-glass chimney I have put on the lamp and turned the flame on full, it will stand that test. I again have dipped them in water and put them on the lamp, and turned on the flame full, and it stands that test. Lead-glass chimneys will average three months' use; lime or bottle glass will break, one a day.

W. T. GILLINDER.

WILLIAM ROBINSON, engineer of the propeller *Orontes*, indicted last summer for over-loading the safety-valve of that vessel, has just been convicted in the United States Court at Buffalo, and sentenced to pay a fine of $200 and be imprisoned in the Penitentiary for four months. This is the first conviction under the law.

THERE are 22,500 miles of railroad in the Union States, and 5,000 miles of canals.

MANUFACTURE OF STEEL.

Steel has been called a carbide of iron as it has been supposed that it was principally composed of iron, united to about one per cent of carbon. Latterly, however, according to M. Frémy, of Paris, and some others, it is supposed to be a nitro-carbide of iron, and that it is a small quantity of nitrogen which is the chief agent in giving to this iron alloy its well-known steel qualities. Steel is manufactured in different ways. In Germany it is produced direct from pig iron, which contains about 4 or 5 per cent of carbon, not however, it would appear, in chemical combination, but simply mechanically mixed with the metal. The pig iron is worked in a suitable furnace until the amount of carbon in it is reduced to the proper proportion. The process of decarbonization requires great care, skill and judgment on the part of the workman. German steel has always one great defect, viz., iron is produced along with the steel, and becomes intimately mixed up with it throughout the mass, thus destroying its hardening quality.

The English way of making steel is the reverse of the German, the article being produced by the carbonization of pure malleable iron bars; the process is generally called cementation, and the product converted or cemented steel. The best steel is produced from the iron obtained from the ores in Sweden.

The cementing furnace, in which iron is converted into steel, is of rectangular shape; it is covered in by a semicircular arch, with a circular hole left in the center, 12 inches diameter, which is opened when the furnace is cooling. A large cone or hood, 30 or 40 feet high, open at the top, is built around it, which serves to shelter the furnace within, also to increase the draught and carry off the smoke. The furnace contains two troughs or chests, technically called "pots," made either of fire stone or fire brick, and each of them 12 feet long by 3 feet wide and 3 feet deep. They are placed on opposite sides of the grate, which occupies the whole length of the furnace. Two openings in the front of the arch, one above each pot, serve to admit and remove the bars. These openings are about 8 inches square; a piece of iron is placed in each, upon which the bars slide in and out of the furnace; a third much larger opening in the middle, between the two pots, serves to admit the workman who charges the pots. The grate is open at each end, where it is supplied with fuel (coal); the flame rises between the two pots, and passes also below and around them, through a number of horizontal and vertical flues and air-holes leading to the chimneys. The pots are, of course, charged before the fire is lighted. The workman enters by the large opening in the middle, and proceeds to charge the pots with alternate layers of charcoal powder and iron bars. The charcoal powder or dust used in the process, is technically called cement: charcoal made from hard wood is generally considered the most suitable; some manufacturers, however, use soot instead; others, a mixture of nine parts of charcoal dust and one part of ashes; some add also a little salt. The workman spreads a layer, about two inches deep, over the bottom of the pots; on this he places a layer of iron bars, which he lays down flat, near each other, except those next to side of the pot, which he places and inch from it; he then spreads another layer of charcoal dust, about an inch thick, over the bars, then again a layer of bars, and so on, alternately, up to within six inches of the top. The top is now covered over, first, with a layer of charcoal about an inch or an inch and a half thick, then loamy earth, four or five inches thick, so as to cement the whole closely down, to ensure entire exclusion of the air. The full charge is about 10 or 12 tuns.

The fire is now lighted below and between the pots, and the iron gradually heated. It takes about four days to heat it through; the furnace has then attained its maximum heat, which is maintained for two or three days; after this a test bar is drawn out to see how the conversion is going on. The heat is subsequently regulated according to the degree of hardness which may be required. The process is considered complete when the cementation is found to extend to the center of the test bar. Eight days generally suffice to convert iron into soft steel, and from nine to eleven days to convert it into the harder sorts.

After the termination of the process, the converted bars are found to have slightly increased in length the one hundred and twentieth part, in weight the two hundredth part, on an average; on breaking a bar across the texture is found to be no longer fibrous, but granular or crystalline. The converted bars are also covered with blisters, which were formerly attributed by some to the expansion of the minute bubbles of air within them, by others to dilatation of the metal occasioned by the presence of sulphur, various salts or zinc, but which it would now appear are simply occasioned by imperfections in the iron, being thrown up in the unsound parts by the dilatation of the metal, and introduction of carbon between those laminæ which are imperfectly welded.

These blisters on the surface have procured for this article the well-known appellation of blistered steel. In this state it is not suited for the manufacture of edge tools. To fit it for the latter purpose, it is passed through the process of shearing or tilting, by which it is made into shear-steel, so called, according to some, from its having been much used in the manufacture of shears for cloth mills; according to others, from being originally employed in the manufacture of shears for cutting the wool from sheep.

The blistered steel is prepared for tilting by breaking the bar into lengths of about thirty inches, piling six or eight of them together, and securing the ends within an iron ring, terminating in a bar about five feet long, which serves as a handle. The pile is then raised to a welding heat in a wind furnace, and is covered with sand, which, melting on the surface, and running over it like fluid glass, forms a protecting coat to defend the metal from the oxidizing influence of the air. When the proper degree of heat has been attained, the fagot or pile is removed from the furnace and placed under a hammer, which unites the pieces into a rod or bar, and closes up internal fissures. This rod is then again brought to a welding heat, and in that condition submitted to the action of the tilt-hammer which we shall have occasion to describe in the course of this paper. The effect of this process is to restore the fibrous character of the metal, and to close all the loose parts and seams. Shear-steel is close, hard, and elastic, and retains the property of welding; it is also capable of being polished. It is much used for tools composed jointly of steel and iron.

Shear-steel, though unquestionably vastly superior to blistered steel, is by no means free from defects, not even after having passed through several tiltings; the great inherent defect in it is inequality of texture and hardness, the outer parts of the bars being invariably and unavoidably more strongly carbonized than the inner and central layers. This defect may, however, be cured, and uniformity of texture and hardness ensured throughout the mass, by another process, viz., casting.

This process consists in melting blistered steel, pouring the melted metal into cast-iron moulds, and subjecting the ingot obtained to the action of the hammer or roller.

The blistered steel is broken in pieces and charged into crucibles made of Stourbridge clay; these crucibles are shaped like a barrel, and fitted with a cover, cemented down with a fusible lute, which, melting after a time, makes the joining the tighter. Each crucible can stand three charges a day, after which it is burnt through; the first charge, about 36 lbs., takes from three to four hours to melt; the second charge, about 32 lbs., about three hours; and the third, about 28 or 30 lbs., from two hours to two hours and a half. The furnaces are common brass-founders' air or wind furnaces, each of them just large enough to hold two crucibles. Coke is the fuel used, the consumption averaging 3½ tuns per tun of cast steel.

The ingots are re-heated in an open forge fire, then passed under a heavy helve hammer, weighing several tuns, the blows being dealt gently at first, in consideration of the crystalline structure of the cast metal; but as the fibrous structure is gradually restored, the strength of the blows is increased. The steel is reduced under the hammer to sizes as small as three-quarters of an inch square. Smaller bars are finished under the tilt hammer, and rollers are also occasionally used, especially for steel of round, semi circular, and triangular sections.

Cast steel is the most uniform in texture and hardness, and altogether best suited for the making of cutting tools, especially of those made entirely of steel. Some sorts of it, however, will not stand the ordinary process of welding, and are therefore altogether unfit for tools made jointly of iron and steel.

Photographing the Eclipse.

The Paris correspondent of the London *Photographic News* says:—

Photographers and astronomers are on the *qui vive*, making their preparations to observe the eclipse of the sun on the 31st December next, to which the recent discoveries of MM. Bunsen and Kirchoff in celestial chemistry impart a new and additional interest.

One point to which observation will be specially directed is the examination of the spectrum of the corona, with which the moon will be surrounded for a moment, in that portion nearest the sun, to see if this aureola exhibits an inversion of the ordinary solar spectrum, or not, that is to say, whether Fraunhofer's rays will be replaced by brilliant lines.

Since the publication of the labors of MM. Bunsen and Kirchoff, the question of a solar atmosphere has acquired a basis, and is susceptible of proof by direct experiment. If, for example, the spectrum of the aureola, which will be produced on the 31st December next, exhibits to us an inversion of the solar spectrum, the much vexed question will be solved, and the existence of a solar atmosphere will become a definite scientific fact. If the contrary should be the case, we may be compelled to admit that absorption takes place in the substance of the photosphere, the surface of which emits not only all the rays, but which doubtless contributes to the light of the sun by a part of its thickness; whichever it may be, the experiment is not impracticable, as it has already been performed. Sig. Fusinieri, of Vicenza, on the occasion of the magnificent solar eclipse of 1842, analyzed the spectrum of the aureola. It appears, however, that he did not attach that importance to it that recent discoveries have now rendered evident. He contented himself with remarking that green was entirely absent from the spectrum of the aureola. The season at which the coming eclipse takes place does not encourage the expectation of fair weather; but we hope for the best.

Hawaiian Islands.

The Honolulu *Commercial Advertizer* says:—Persons, and even old residents, speaking about these islands, are often unable to remember common place data. The principal facts relating to our group should be familiar to every one.

Islands.—There are twelve islands in the group—seven of which are inhabited, the other five barren, but visited by native fishermen.

Population.—According to the census of 1860, the population was 69,800; of which 2,716 were foreigners. The population of Honolulu and suburbs is 14,310; of which 1,639 are foreigners.

Distances.—From Honolulu (in a direct line) to Lahaina, 78 miles; to Kawaihae, 142 miles; to Hilo *via* Kohala point, 215 miles; to Kealakeakua Bay *via* Lahaina, 180 miles; to Kau point *via* Lahaina and Kealakeakua, 220 miles. From Honolulu to Koloa, 125 miles.

Channels.—The Kauai channel is about 75 miles wide; the Oahu and Molokai channel, 24 miles; the Molokai and Maui channel, 10 miles; and the Hawaii channel, 22 miles wide.

Area.—The area of Hawaii has been estimated at 4,000 square miles, Maui at 600, Oahu and Kauai, each 520; and the area of the twelve islands at about 6,000 square miles, or 3,840,000 acres.

PARR'S TOOL CHEST.—We take pleasure in calling the attention of our readers to an advertisement on another page of Parr's tool chest, fitted with all the implements necessary for a carpenter or cabinet maker, and furnished at a low price. Mr. Parr also makes small chests for amateurs, farmers and others who are not practically skilled in the use of tools, and who do not need so great a variety as the professional artizan.

THE English papers state that the cotton speculation is going on in England at a tremendous rate; it is at present carried on by ladies, clergymen, lawyers, and others not regularly engaged in business, who have fallen into the mania as others did into the railway mania of 1845. The professional cotton speculators have retired from action. They know that the bubble must burst.

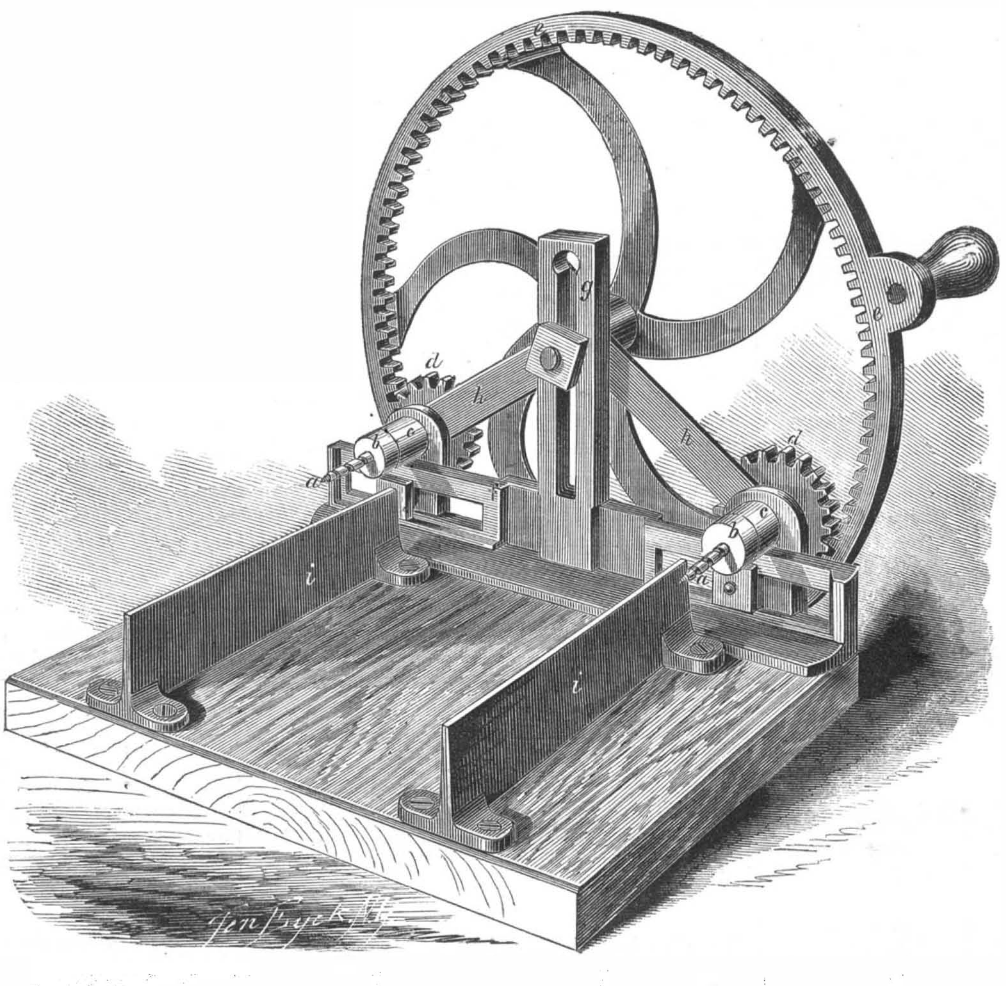
Improved Boring Machine.

A person who will visit the yards of some of the large stave dealers of this city, and see the acres of ground covered with high piles of staves, may form a faint idea of the immense number of barrels that are annually made in the country. This industry being so large, any improvement in it, however slight, is of corresponding importance. The machine represented in the accompanying engraving is designed for boring the holes for the dowel pins, which are used to fasten the several pieces of a barrel head together. It was invented by N. R. Merchant, of Guilford, N. Y., and is in practical and successful operation.

Two bits are arranged, to be driven rapidly by a large spur wheel, so as to bore both of the dowels required in one piece of a barrel head at the same time, to bore them very quickly and with perfect accuracy of position, causing the pieces to fit together exactly at the holes. The bits, *a a*, are keyed securely into the revolving tubes, *b b*. These tubes are reduced in size at about half an inch from their outer ends, and the smaller portions pass through the stationary tubular bearings, *c c*, and carry the pinions, *d d*, upon their ends. These pinions mesh into a gear upon the inner side of the rim of the large wheel, *e*. It will be seen that as the wheel is turned, both bits are revolved in the same direction.

The distance apart of the bits is made variable to adjust it to barrels of different sizes. This is effected by securing the bearings of the bits to the horizontal bar, *f*, by set screws passing through long slots in the bar. The wheel, *e*, must of course be raised or lowered at the same time to preserve its connections with the teeth of the pinions, and it is consequently secured to its standard, *g*, by a set screw passing through a long slat. To preserve the proper relative positions of the wheel, *e*, and the pinions, *d d*, braces, *h h*, connect the centers of the pinions with the center of the wheel; the several bearings passing through holes in these braces near their ends. The stuff to be bored is laid upon the two supports or guides, *i i*.

The patent for this invention was granted May 28, 1861, and further information in relation to it may be obtained by addressing A. P. Merchant, at Guilford, N. Y., or C. S. Little, No. 59 Fulton street, New York city.



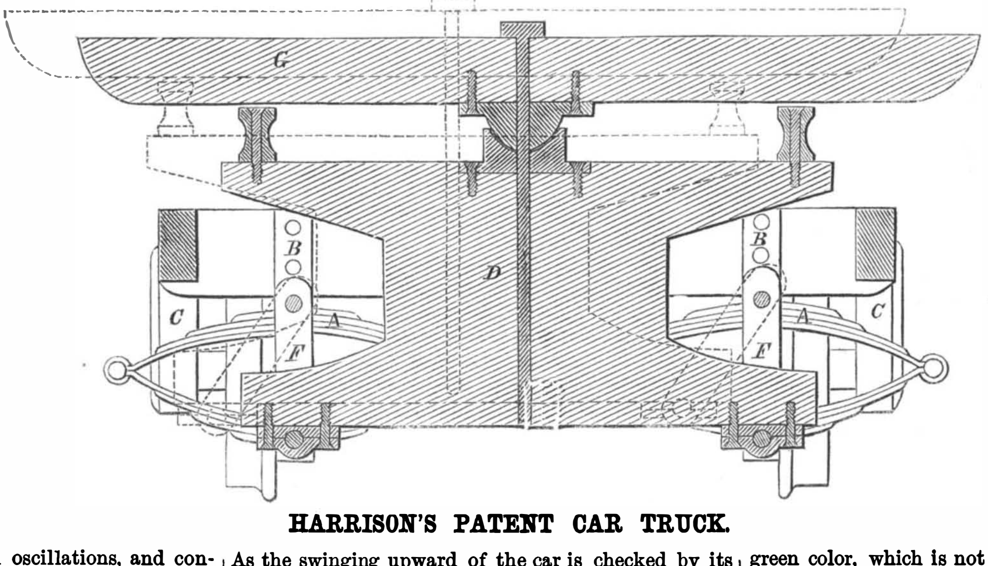
MERCHANT'S BORING MACHINE.

Improved Car Truck.

In the ordinary mode of constructing the trucks of railroad cars the bolster is supported on the top of the springs in such a manner as to have the motion of an inverted pendulum in its lateral oscillations, and consequently the car at best is very unsteady. The only mode yet adopted to provide for any oscillation, and at the same time render it safe, is so to construct the portion of the bolster between the wheel beams, as that its oscillation will be limited by the beams, against which it is consequently constantly striking, much to the injury of the car and the annoyance of the passengers. The invention here illustrated is designed to overcome this difficulty.

It consists essentially in suspending the bolster in swinging stirrups, which hang from the tops of the springs on pivots. The springs, A A, (see engraving,) are supported at their bottoms by straps, B B, attached rigidly to those cross timbers of the truck which rest on the blocks, C C, rising from the axle. The bolster, D, is then hung upon the lower ends of the stirrups, F F, which are supported by the tops of the springs on pivot pins, so that they may swing sideways, as shown by the dotted lines. Dotted lines also indicate the position which would be occupied by the bolster and by the lower timbers, G, of the car at the extreme limit of this lateral motion.

By this arrangement, while the full elasticity of the springs is obtained, the car is rendered more steady.



HARRISON'S PATENT CAR TRUCK.

As the swinging upward of the car is checked by its weight, there is no necessity for confining the bolster between the wheel beams of the truck.

A bolster may be applied in this way in the place from which an ordinary bolster has been removed, at small expense, and without any alteration of the truck. By a slight modification it is applicable to six-wheeled trucks, as well as to those having four wheels.

The patent for this invention was solicited through the Scientific American Patent Agency, the claims of which appear in another page, and further information in relation to it may be obtained by addressing Amos T. Hall, Treasurer, Chicago, Burlington and Quincy R. R., at Chicago, Ill. The inventor, M. La Rue Harrison, is in the army at present, stationed at Camp Rolla, in Missouri. Mr. Hall is authorized to act for the patentee, and he should be addressed by persons desiring to use the invention.

Making Chlorine.

Chloride of copper is prepared by dissolving the oxide or the native carbonate of copper in hydrochloric acid and then evaporating to dryness until the crystals are obtained. This product is dried thoroughly, then mixed with sand and introduced into retorts like those used for generating gas. These retorts are heated and the dry chlorine gas passes over. This is the most simple way to obtain pure dry chlorine gas for the laboratory. The residuum left in the retorts is a sub-chloride, which can be used over and over again by reconverting it into chloride by exposure to the action of the air in the presence of hydrochloric acid.

Patent Ointment.

C. Stevens, of London, England, has obtained a patent in his own country for an ointment composed of litharge one pound, and strong vinegar and olive oil each one pint. These substances are well incorporated, and then boiled till they form a thickish paste. It is applied by spreading it upon bibulous paper. Sugar of lead and olive oil will make a similar ointment, as the vinegar converts the litharge into sugar of lead. This is one of the mysteries of chemistry—sour vinegar unites with lead, forming the acetate or sugar of lead, a substance of a sweet taste.

Cheap Marine Glue.

The celebrated marine glue is composed of a solution of india rubber and lac varnish, and it really does not contain a particle of genuine glue. As lac is becoming dearer every year a substitute for it has been sought for in the manufacture of marine glue, which is so well adapted for coating the interior of aquariums, wooden water tanks and for caulking the seams of ships. It is stated that asphaltum dissolved in refined naphtha with some india rubber, makes a cheap and very good marine glue.

WHEN the bichromate of potash is heated with the phosphate of ammonia it forms a light but beautiful green color, which is not affected by a red heat.

WOOD may be bleached white, like cotton cloth or paper pulp, by exposing it to the action of warm chlorine liquor or to chlorine gas, when moist.

IN burning anthracite coal every tun of it requires to be supplied with 200,000 cubic feet of air in the furnace in order to produce perfect combustion.

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VOL. V. NO. 23.....[NEW SERIES.]....*Seventeenth Year*

NEW YORK, SATURDAY, DECEMBER 7, 1861.

FIFTEEN THOUSAND PATENTS SECURED THROUGH OUR AGENCY.

The publishers of this paper have been engaged in procuring patents for the past sixteen years, during which time they have acted as Attorneys for more than FIFTEEN THOUSAND patentees. Nearly all the patents taken by American citizens in FOREIGN countries are procured through the agency of this office.

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INFLUENCE OF INVENTORS UPON THEIR AGE.

Truly the race of invention is the race of progress. Nations may have won fame in arms, arts and literature; they may have acquired distinction for the wisdom of their national polity, and for the astuteness of their statesmen and rulers, but while such gifts and acquisitions may have tended to a partial and short-lived glory, or to individual distinction and power, they never laid the basis of permanent national greatness; they did not contribute to the widespread prosperity of peoples; they did not resolve the grand social problem of conferring the greatest amount of happiness upon the greatest number. Literature, arms, arts, science or statesmanship, however grand in themselves, have not conduced in the necessary degree to the development of the material resources which Providence has implanted in every clime. They have not multiplied the results of human labor; they left unfulfilled that grand desideratum as anxiously looked for as the discovery of the philosopher's stone by the alchemists of old—"the annihilation of time and space"—and if their most distinguished professors ever conceived the design, they never succeeded in carrying it out, "to make two blades of grass grow where only one grew before." Though they may have crowned the Corinthian column, they never constituted the column itself, which must be based upon a wider consideration of popular life and human interest.

The accomplishment of these miracles was left exclusively to the inventors, who are emphatically among the true benefactors of their age. It is they who have applied science in all its ramifications to the elucidation and production of the wants and requirements of every-day life. It has been said that "there is no royal road to knowledge;" but who can deny that there have been discovered by our inventors royal roads in abundance to reach splendid results in seconds of time which could only be rudely obtained by long days of wearisome and intense application? Have not our inventors lightened the burdens in every department of human labor? Behold their grand achievements of the steam engine and the electric telegraph, whose superhuman agencies have left the mind lost in amazement, which have not only rendered the age illustrious, but have absolutely astounded the world! Indeed, we ask in what species of human effort have not the inventor's labors been beneficently felt! Does not the range of his influence extend from the cottage to the palace? Are not the workings of his genius felt at the desk of the merchant and the bureau of the statesman? Is it not seen in the room of the humble seamstress, as her busy needle plies with electric speed in the sewing machine, marvelously abridging her labors while it multiplies her profits? It is seen in the machine which reaps a hundred fold the superabundance of the teeming valley, as well as in that which climbs the mountain and brings fertility to its arid sides.

Our own nation may not be able to boast of as many achievements in literature, arms or arts as the old nations of Europe; but there are men among us who have taught those old nations the most useful lessons for the multiplication of their domestic comforts, the development of their material prosperity, their social advancement and their national progress.

But our American inventors can afford to shed light upon the old world. They have a superabundant fertility of inventive resource. They have a professional pride, and although they have a proper and natural desire to reap a well-earned pecuniary advantage from their labors, they must be proud to feel that they have contributed so many blessings to the world at large.

Hitherto our inventors have proved worthy of themselves, of their own high calling and of their country. Let them now continue their glorious and beneficent labors on even a larger scale than ever. The times in which we live are making the very epic of national history, and they certainly afford our inventors grand opportunities to become national benefactors of their own beloved country, as well as to acquire fortune and fame for themselves and their families. Let national pride combine with personal interest to inspire our great inventors to renew their efforts to bring forward something worthy of their own fame—worthy of the national crisis; something which in war as well as in peace will prove them equal to every emergency—will demonstrate to the world that they are capable of producing what has not only promoted our national greatness, but what will preserve our national independence.

For ourselves, identified as we are for so many years with our age and nation in their best improvements, their advancement and their greatness, we shall rejoice personally as well as professionally in every new triumph in the field of invention; and whether such triumph conduces to meet our present great national emergency, or some useful purpose of domestic economy or agricultural or other utilizing necessity, our columns shall record it with pride and pleasure.

ENGLAND AND THE UNITED STATES.

In accordance with a time-honored custom which has existed in London for upward of six hundred years, the Lord Mayor's day was celebrated in that famous old city on the 9th of November. The new Lord Mayor (Cubitt) gave a grand entertainment to a a large and brilliant assemblage of guests, among whom were several distinguished members of the diplomatic corps.

The Lord Mayor, in proposing the health of the American Minister, Hon. Charles Francis Adams, gave utterance to the following encouraging words:—"I am about," he says, "to associate with this toast the name of a gentleman whose mind must necessarily, under the circumstances, be occupied much with the affairs of his own country, which, unhappily, is at this moment in a condition to require the sympathies of the world. *In no country will those sympathies be yielded more readily than in this.* (Cheers.) I need not say I allude to America. I will associate with this toast the name of the American Minister, and I can assure him—taking on myself for the moment to be the exponent of the feeling and sentiments of this great city, over which I have the honor to preside—*I can assure him of the entire sympathy of the citizens of London, and I think I may say of the whole British people.* I can assure him that our most earnest desire is to see the day when those difficulties, which we hope are only temporary, shall be entirely eradicated from the soil of that great and free country. (Loud cheers)."

Mr. Adams responded in a very excellent speech, which was well received not only by the guests present, but also by the press of London.

Lord Palmerston also gave utterance to kind and fraternal sentiments toward this country, and expressed deep sympathy with our people in the struggle. The course which the British government has pursued in this unhappy controversy has appeared to us eminently conservative from the commencement, and we cannot but believe that, in spite of the bullying and blustering of certain journals on both sides, all complications arising between the two governments will be settled through the ordinary channels of peaceful diplomacy. It cannot be denied, however, that there is in this country an uneasy, reckless class of persons mostly led on by miserable, defunct politicians who would delight in nothing more than to see the United States involved in a war with Great Britain. On the other hand, if we may judge from the temper of a portion of the British press, this feeling is reciprocated in that country. How far those disorganizing and dangerous factions may succeed in their nefarious designs remains yet to be seen, but we assert, without fear of successful contradiction, that nine-tenths of the wealth and intelligence of the American people are sincerely desirous of preserving peace with the mother country, and we are free to say that we are of the opinion that the better classes of England, including the government, have no wish to become involved in a war with us. We hope and believe that there is wisdom enough in these two great governments to steer clear of all difficulties. We are warring against a rebellion that threatens the overthrow of our government, which is compelled to protect itself against all the machinations of the enemy, who will leave no arts untried to accomplish its ends. It seems to us that no true-hearted Briton can fail to respond to the noble words recently uttered by the Duke of Argyll. "I know of no government," said he, "which has ever existed in the world that could possibly have admitted the right of secession from its own allegiance. There are some things worth fighting for, and national existence is one of them."

In reference to the Slidell-Mason affair we believe, in spite of newspaper clamor, that the respective governments will deal with the questions growing out of their seizure with calmness and deliberation—the one demanding nothing but what is right, the other yielding to nothing that is wrong—and that the matter which seems now grave in some of its aspects will be satisfactorily adjusted. We are pleased to see that that able journal, the Toronto *Globe*, is disposed to discuss the subject calmly and without prejudice. This is as it should be. Our government has a right to claim the sympathy of every other liberal government on earth, and in dealing with many questions likely to grow out of its defence, on land and sea, it has claim to a generous forbearance from all nations with whom we are at peace.

INTERESTING FACTS ABOUT ELECTROPLATING

The art of electroplating sprung from a discovery made at the same time, about twenty-five years ago, by Mr. Spencer, of England, and Professor Jacobi, of Russia. They noticed that when a galvanic current was passed through a solution of copper, it deposited pure metal upon a conducting surface, and from this they advanced to the copying of medals and other objects by electricity. Being unable to agree about taking out a joint patent, the discovery was published and given to the world. When first announced, persons of all grades and sexes became electrified with it, and amateur electrotypers with their molds and batteries were to be found in almost every household. From an amusement, the discovery has grown up to be a grand and beautiful art. It essentially consists in coating articles, such as table spoons, cups and various vessels, made of brass, copper or white metal with a skin of pure silver or gold by a current of electricity passed through the solution in which the articles to be plated are immersed. The electric current which is most commonly employed in electroplating is derived from the decomposition of zinc plates in what is called a "Smee battery," which consists of alternate large plates of zinc and a negative element, such as copper or a platinized plate. A constant quantity current of electricity derived from a magneto-electro machine (such as the one illustrated on another page) is equally applicable, and is now practically employed, for this purpose. We will describe the art of electroplating in such a manner that it may be very generally understood.

Let us suppose that at one side of a room there stands a long and deep wooden box with two horizontal copper rods on its top placed near together and extending from end to end. The wire from the positive pole of the battery is attached to one of these rods and the conducting wire of the negative pole to the other. The trough is nearly filled with a straw-colored solution made by dissolving silver in aquafortis (nitric acid) and obtaining nitrate of silver in crystals, then forming another salt—the cyanide of silver—by combining the silver of the nitrate with the cyanide of potassium.

Let us also suppose we have an old or a new teapot to be plated with silver. After its surface has been perfectly freed from grease and oxide, it is ready to be put in the solution by a copper wire suspended from the copper rod connected with the negative wire, and just opposite to it; there is also suspended in the box a sheet of silver connected with the other copper rod that is in communication with the positive wire of the battery. An electric circuit is now formed and a current passes down through the sheet silver dissolving it, thence it passes through the solution to the teapot or article to be plated, and deposits a coat of silver over its surface, by decomposing the solution, and making it adhere to the negative pole. When a coat of sufficient thickness is deposited, the article is lifted out, washed in soft water, and its surface polished with a steel burnisher, when it becomes as bright as the face of a mirror. This is a description of the art of electro-plating, and it may be practiced for pleasure by almost any person having a small machine or battery and a very inexpensive apparatus.

The wire which proceeds from the copper plate of a galvanic battery to a depositing trough is called the *anode*—the positive pole; that which proceeds from the zinc plate to the trough, is called the *cathode*, or negative pole. The plate of silver to supply the solution is connected to the anode. The current passes from the positive to the negative pole, carrying the silver with it and making it adhere to the prepared metal. In reading scientific works on electric science many persons become confused with the use of the terms positive and negative. The zinc plate is the positive element, the copper the negative; but as the current passes from the copper along the wire, the pole of the copper is the anode. The electricity passes to the zinc, thence it traverses to the copper through the solution, forming the mysterious electric circuit.

Not many years ago silver-plated wares were all manufactured by placing leaf silver upon the surface of copper and brass articles, then submitting them to the action of fire, by which the silver was partially fused and thus made to adhere. This was called "fire-plating," an art still pursued to a considerable extent in England and France. But electro-plating, though so recently discovered, is much more generally practiced. Much of the hard wares, such as communion service plate and tea-table sets, which are exposed in jeweler's show-windows, are indebted to the electric current for their beauty and brilliancy.

MELODEONS—HARMONIUMS.

The organ is undoubtedly the king of instruments for sublimity and variety of tone, but next to it, we believe, the American melodeon holds the second place. The tones of the organ are produced by wind forced through pipes, those of the melodeon by wind rushing through reeds. The latter are rectangular openings or narrow slits in which are thin metallic pallets; against these the wind is made to impinge by a bellows and thus produce the different tones according to the size of the reeds and the velocity of the wind rushing through them. The small brass reeds upon which boys produce inharmonious mouth music by blowing through them, will afford some idea of the nature of a musical reed instrument, and an accordion, operated by a small bellows between the hands, will impart some idea of the melodeon in its simplest form. The European seraphine is merely an enlarged accordion; the wind to operate the reeds is compressed in a bellows underneath the key boards, and it is driven through the reeds by opening a communication between them and the outlet of the bellows. The keys throw open the valves of the passages. The American melodeon is essentially different in one principle of its arrangement from the seraphine, and it is greatly superior on account of this improvement. Instead of placing the reeds in such a manner, in relation to the bellows, that the wind is forced from the bellows through them, they are so situated that the wind rushes through them into the vacuum produced in the bellows; they are placed in connection with the inlet instead of the outlet of the wind chest. By this improvement the makers are enabled to arrange the reeds more conveniently for examination, and also make them produce superior tones. This essential feature of American melodeons was invented only about fourteen years ago by Jeremiah Carhart, of Buffalo, N. Y., but now of New York city, and was secured by patent, which is now in force.

From the date of this improvement there commenced a new era in the manufacture of such instruments. Quite a number of patents have since been secured for different improvements, and the business has become greatly extended, there being quite a number of manufacturers in different sections of the country, principally, however, in the Eastern and Middle States—the whole turning out about two hundred instruments weekly.

The most simple melodeons have one set of reeds and one bank of keys, and a compass of four octaves. A higher class of melodeon has a range of five and six octaves with one set of reeds. Another has two sets of reeds with one bank of keys, and a still higher class has two banks of keys, two and sometimes three sets of reeds, and from one to four stops. Quite lately a new and far higher style of this instrument has been introduced and has been called the harmonium. Although this instrument was originally from France, those which have been made in this country have had all the peculiarities of the melodeon applied to them, and no foreign instrument is capable of rivaling them in variety and quality of tone. The American harmonium surpasses every known instrument of this class for the performance of organ music, or any music that can possibly be elicited from a keyed instrument where the tones are sustained as long as the keys are held down.

A musical friend of ours having lately obtained one of these instruments, made by C. Peloubet, of Bloomfield, N. J., he dissected it for our gratification, and permitted us to enjoy a full examination of its parts, and we will endeavor to give such a description of it as to convey a good idea of its arrangement and powers. Its exterior resembles a large melodeon, but it has three manuals or key boards for the hands, the one rising behind the other in steps. A long seat for the performer enables him to reach either of the key boards or the pedals for the feet, and these can be touched either separately or operated together. On the sides are placed eight nobs, called stops. Each set of keys is really an instrument in itself; it has its own wind chest and its separate connection with the bellows below, which latter wind reservoir the three key boards have in common. Each key moves but one pallet valve, forming the connection through the wind chest between the air outside and the vacuum formed in the bellows. The reeds or stops of the upper or "swell" bank of keys are inclosed in a box, which may be opened or shut at pleasure by a lever, which is moved by the foot, thus making a swell, from which the bank of keys takes its name. The second or middle bank of keys contains three stops. These are all loud and full, hence called "great organ." The lower bank of keys controls tones of a subdued and gentle character, suitable for the accompaniment of a melody or for church harmonies, hence it is called "choir organ." The stops control the quality of the sounds. The three on the upper bank of keys are the "stopped diapason," "flute" and "tremolante." These may be drawn separately or altogether. When the tremolante stop is drawn, trembling sounds, expressing mournful accents, are emitted. There are four stops of different characters on the middle key board (great organ). These may be drawn separately or altogether, and by a stop called the "coupler" they can be combined with any of the stops of the upper key board. The choir organ, or lower bank of keys, has a sweetly-voiced stop, different from any of the preceding. From this general description it will be apprehended that an endless variety of tones can be produced by this instrument. One combination or effect follows another with such facility that it appears difficult to persuade ourselves that these are produced by one instrument. But really it is several wind instruments combined in one, for there are seven sets of reeds, each having a pitch or character of its own, and thus truly seven instruments may be used separately or in conjunction; it therefore offers facilities for the performance of music of the most diversified character. The little knob at the one side, called "flute," when drawn out and put under the performer's control, calls out the soft tones of the "breathing flute;" it answers to the touch of the finger, and airy melodies, like notes of warbling songsters, are heard. Another stop produces tones like the martial voice of the trumpet. The "stopped diapason" produces tones of a plaintive character, suited to a devotional spirit. In short, as the stops are called, one after another, to add their voice to the choir of reeds, the effect is grand to a degree which we could scarcely have believed possible in any instrument but a large organ. A stop is a long cushioned strip, which covers and opens a passage for the wind to pass through the reeds. In this instrument the wind can be made to pass over five sets of reeds, with one set of keys, and by the touch of one lever, thus producing five notes through two passages in passing to the one chest.

The inspiring influence of music upon man in all ages and conditions of life is well known. It tends to elevate the hopes, refine the feelings and sooth the woes of humanity. On the battle field, in the temple and at the fireside its power is felt and acknowledged. One of the greatest improvements rendered to social life in modern times is the construction of a higher class of instruments for the domestic circle. Home should be rendered happy by all the accessories which make it agreeable to young and old, and in the march of improvement a new instrument like the harmonium, approaching so nearly to the kingly organ, and yet made subservient to the execution of music in the household, as well as in the church, is certainly a valuable acquisition to the refinements of life.

THE COAST SURVEY AND THE GOVERNMENT.

Some of our cotemporaries are very justly calling public attention to the great value of the Coast Survey not only to our navy, but also to our disembarking troops upon the Southern coast. To the commerce of a maratime nation it is of the utmost importance that the survey of the coast of the country should be not only on an extended scale, but also be most carefully done. Now, while the enemies of the government are throwing all possible obstructions in the way of our vessels, minute details of the maps of the Chesapeake, the North Carolina Inlets and Sounds, Port Royal entrance, Bull's Bay, Fernandina, and various other points on the Gulf coast, are of immediate interest and importance; and we fully realize that the nation is more than repaid by the war-use of the coast survey for the annual appropriations granted to it for a totally different purpose. The Confederates are also supplied with these charts of the Coast Survey, but they are much more valuable to us than to them, as we have command of the sea. On our ships and in our regiments forming expeditions to operate on the Southern coast these charts are studied, and thus mistakes and probable disasters have been avoided. Not a ship of our great fleet but was moving upon almost familiar ground; not a boat but landed its troops just where soundings and topography directed.

To such expeditions as must be now constantly moving southward the value of the carefully prepared charts of the Survey Office cannot be over estimated, and it is right that the press, as representing the people, should acknowledge their indebtedness to the source from which they extract pages of information day after day.

Geoffrey St. Hilaire.—Late news from Europe contains intelligence of the decease of this renowned zoologist, in Paris, on the 9th ult. He was born in 1805, and was therefore 56 years of age at his death. He was the son of E. Geoffrey the celebrated French anatomist, and was a prodigy of scientific learning at 19 years of age. He was a professor of the natural sciences and published several works on anatomy and physiology, which have won for him a high position among the great names of the earth. He was one of those cool, utilitarian French philosophers, and was the first to advocate the use of horse-flesh for human food in France.

INFORMATION USEFUL TO PATENTEES.

From inquiries repeatedly made of us as to the rights of minors and women who secure patents, and as to who are the legitimate owners of inventions issued under various circumstances, we are inclined to believe that a few items of information under this head will interest our inventor readers at least :—

RIGHTS OF MINORS.

A minor can take a patent in his own name, but it is subject to the control of one of his parents or his legal guardian, the same as any other property that may come into his possession.

By the laws of the United States, as well as Great Britain, minors, until they are twenty-one years of age, are not considered competent to do business. Minors could not, therefore, legally transfer a patent; neither could the parent or legal guardian do this in case the term of the patent should extend beyond the time when the minor becomes of age. There are difficulties connected with the transfer of patents granted to minors which appear never to have been settled.

WOMEN'S RIGHTS.

Women can also apply for and obtain patents upon the same terms as the sterner sex. We frequently take out patents for ladies; but they do not exercise their ingenuity as much as they ought. If the woman-patentee is of age she can transfer a patent legally, and enjoy all the rights and privileges of any one.

CURIOUS QUESTION ABOUT OWNERSHIP IN PATENTS.

Many employers think themselves entitled to all inventions made by persons in their service. This is not so unless there is a stipulation to that effect; and it is high time that employers should abandon such unjust pretensions. No inventor need fear of thus losing his right, unless it can be proved that he was employed expressly to bring out such invention for the benefit of his employer.

In regard to inventions made by slaves, it has been the practice of the Patent Office to reject such applications, as they are considered legally incompetent alike to receive the patent and to transfer their interest to others. In reference to free colored men, we believe them also to be incompetent to receive a patent, as under the United States Laws they are not regarded as citizens, and could not therefore defend a patent against infringers in the United States courts.

JOINT PATENTEES.—RECORDING ASSIGNMENTS.

There are three classes of assignments that must be recorded at the Patent Office within three months from their date, in order to insure their validity against subsequent purchasers without notice. These are, first, an assignment of the entire patent; second, an undivided portion of a patent; third, the sale of an exclusive right, under a patent, for a particular territory. Illustration: If A, having already sold a patent to B, turns knave and makes a second sale of the same property to C, who records it, (B having omitted to place his assignment on record within three months, and C having no knowledge of the sale to B), then the assignment to C will be held valid, and that to B becomes null; B's only remedy being a suit for fraud against A.

We are very frequently asked the following question: "A, B and C each own an undivided third-interest in a certain patent. Can A proceed to manufacture and sell the patented article whenever he chooses, without the consent or without accounting to B and C as to the proceeds?"

In answer we say that A can proceed, without consent, to manufacture and sell the patented article whenever he pleases. Whether B and C can procure an order from the Court compelling A to give bonds that he will account for profits and set apart a third share thereof to each, under the direction of the Court is a question as yet undecided.

The opinion, however, prevails that one of the owners in a joint patent may use the invention, freely, for his own benefit, so long as he does not debar the others of the right to do the same.

If an assignment of the invention is made at the time of the application, and the case is rejected after examination, and the inventor or his attorney afterward succeeds in securing the issue of the patent, by appeal or otherwise, this issue does not, as some have supposed, render the transfer invalid. The same remark also applies to a case which may have been withdrawn, and resubmitted and patented under a new application.

RECENT AMERICAN INVENTIONS.

The following inventions are among the most important of those for which patents have recently been granted, and which will be found recorded in our list of Claims.

Planing Saw.—In circular saws intended to saw and plane at a single operation it has been found exceedingly difficult to preserve the planing knives in an effective working condition, owing to the severe lateral stress to which they are subjected. In the above invention guides or supports are secured to the cutters, projecting radially beyond them in the plane of the saw plate, and working in the kerf cut by the ripping teeth. By this means the cutters are effectually preserved from deflection and breakage. The merits of this invention are due to William S. Winsor, of Port Orford, Oregon.

Combined Tent, Overcoat and Cape.—The object of this invention is to combine a tent, overcoat and cape in such a manner that the parts may be compactly folded, carried in the knapsack, be extremely light and capable, with a slight manipulation, of being used in any of the capacities above specified, so that a soldier may be protected in storm while on duty during the day, and be provided with a suitable covering at night. This ingenious article was invented by Henry J. Phillips, of New York city.

Friction Clutch.—The object of this invention is to so provide and apply friction surfaces within a pulley, or its equivalent, that the friction may be brought into action in a more effective manner than in the friction clutches heretofore used. With a view to this end the invention consists, firstly, in the use within a pulley or its equivalent, of segments of metal so combined with a sleeve fitted to slide on the same shaft on which the pulley is placed, that by a sliding movement of the said sleeve upon the shaft the said segments may be forced radially outward against the inner periphery of the pulley and so caused to produce friction by which rotary motion may be imparted from the pulley to the segments, or *vice versa;* and it consists, secondly, in so applying such segments in combination with the shaft and pulley, or its equivalent, that the centrifugal force developed in the segments by their rotary motion shall be allowed to force them outward against the inner periphery of the pulley, and so be productive of friction between the segments and pulley, and made instrumental in or accessory to the transmission of rotary motion. This invention is by Wendell Wright, of New York city.

Projectile.—This invention consists in the construction of a projectile for ordnance with its body composed of a single casting of iron, and a surrounding ring of lead or other soft metal or suitable material capable of lateral expansion, such casting being of such form that the force employed to ram it home in loading, or the force to which it is subject in its discharge, will cause it to be broken in two or more pieces, which will act in such manner as to cause the said ring to be so expanded as to fill the bore and enter the rifle grooves of the gun. It also consists in providing the hard metal portion of the body of a projectile, with projecting collars on each side of its expanding ring, for the purpose of confining the ring in a longitudinal direction, and preventing the formation on the said ring of uneven edges, which tend to deflect it from its true trajectory. It also consists in enveloping the packing ring of soft metal with a band or patch of copper or brass, corrugated longitudinally, to provide for its expansion in a circumferential direction. This invention was patented by I. P. Tice, of New York city.

Pump Attachment.—The pistons of atmospheric pumps frequently become dry, especially if used only at intervals, and as quite an imperfect vacuum can only be found when the piston is dry, considerable time is consumed in pumping before the water is raised and the pump rendered capable of operating perfectly. In many cases it is necessary to pour water into the pump in order that the packing of the piston may swell tight before water can be raised. The object of this invention, patented by John W. Lane, of Newton, N. J., is to obviate this difficulty, and to this end he attaches a water chamber or reservoir to the induction pipe of the pump near its junction with the pump cylinder, said chamber being sufficiently large and in such close proximity to the pump as to supply or fill the latter when the piston is operated, and ensure the perfect action of the piston almost immediately, even if its packing be quite dry.

Padlock.—The object of this invention is to obtain an unpickable padlock of simple construction, and consists in the employment or use of a dog so combined with a guard bar that the latter will keep the former firmly in proper position, and the key, in unlocking the lock, made to act directly on the guard bar or a pendant thereof, the two parts aforesaid forming a simple and efficient means for securing the shackle in the lock. The invention also consists in the employment or use of certain parts, so arranged as to retain a false key if inserted in the lock, so that said key cannot be withdrawn, and by being retained in the lock not only serve as a means to prevent further efforts to pick the lock, but also serve as a means to lead to the detection of the party who made the effort to pick or illegitimately open the same. The above described lock was patented by Thomas Slaight, of Newark, N. J.

Fire Escape.—This invention, patented by Aaron Shute, of Flushing, N. Y., consists in the employment or use of a flexible or chain ladder applied to a balcony of a building in such a way that the ladder may, in case of fire, be released in a moment of time by an inmate of the dwelling, and at various parts of it, and the ladder allowed to descend to the earth, affording a ready means of escape for the occupants. Patents have been applied for in England and France for this invention.

Thanks to our Cotemporaries.

To the newspaper press in the Northern and Western States we are indebted for very many excellent notices of this paper. Probably no other weekly publication was ever favored so extensively in this respect, and we take this occasion to thank our cotemporaries for the editorial courtesies they have extended to us during the sixteen years we have published the SCIENTIFIC AMERICAN. The two following are but specimens of hundreds equally complimentary, which we have clipped from our exchanges. The *Herald*, published at Winsted, Conn., says :—

> Among our numerous exchanges we have no greater favorite than the SCIENTIFIC AMERICAN. Keeping closely to its proper sphere in mechanics; always instructive but never pedantic; always practical and nowise visionary; and, better than all, holding stiffly to the interests of its readers and the public, impartial, never selling its opinions or surrendering them to the interests of outside parties, it is altogether a model journal. Fretted, tired and sick of the continuous roll and rub-a-dub of politics in the common herd of newspapers, it is refreshing now and then to take up a sheet which subserves the interests of the people and the race, instead of those of a mere candidate or party. Then, again, the SCIENTIFIC AMERICAN is unquestionably foremost and first in its class. The mechanic who cannot afford to subscribe for it is unfortunate indeed.

The *Press*, published at Lasalle, Ill., appreciates the SCIENTIFIC AMERICAN, and says :—

> Among all the different newspapers of this country, we think we are justified in the assertion, that the SIENTIFIC AMERICAN, published by Munn & Co., New York, is justly entitled to be ranked among the very best. Certain it is that no one weekly paper contains more useful information for all classes of readers than this ably-conducted journal. Particularly at this time is it of great value. The able, decided position it has taken in defence of the national government in this trying hour, its faithful record of the progress of the war, its scientific articles upon the different weapons introduced in modern warfare, its numerous engravings, its correct list of all patents issued—makes the SCIENTIFIC AMERICAN of almost incalculable value to the American reader. As regards typographical execution, neatness of print, quality of paper, &c., it has no superior. Every farmer, manufacturer, mechanic, artizan, inventor and tradesman should have it.

TO OUR EDITORIAL BRETHREN.

We send a copy of this week's issue of the SCIENTIFIC AMERICAN to every newspaper published in the United States accessible to us through the mail facilities of Uncle Sam, and we take this occasion to thank our brethren of the press for their uniform courtesy toward us ever since we commenced the publication of this journal. Your friendly aid, thus cordially extended, has aided us materially. We acknowledge it with gratitude, and still further appeal to you to speak a good word to your readers in our behalf. To all such journals as publish our prospectus we shall send the SCIENTIFIC AMERICAN one year without an exchange, and would be glad to have such papers as do so sent marked to our office.

THE London *Times* declares that while steam navigation has been a scientific success it has been a pecuniary failure, inasmuch as all the lines of ocean steamers require enormous appropriations from the government to keep them afloat.

PATENTS FOR SEVENTEEN YEARS.

The new Patent Laws enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the government fee required on filing an application for a patent is reduced from **$30** down to **$15**. Other changes in the fees are also made as follows :—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing Disclaimer	$10
On filing application for Design, three and a half years	$10
On filing application for Design, seven years	$15
On filing application for Design, fourteen years	$30

The law abolishes discrimination in fees required of foreigners, except in reference to such countries as discriminate against citizens of the United States—thus allowing English, French, Belgian, Austrian, Russian, Spanish, and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (exceptin cases of designs) on the above terms.

During the last sixteen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN ; and as an evidence of the confidence reposed in our Agency by the Inventors throughout the country, we would state that we have acted as agents for more than FIFTEEN THOUSAND Inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of Inventors and Patentees at home and abroad. Thousands of Inventors for whom we have taken out Patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the Inventors whose Patents were secured through this Office, and afterward illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than are employed at present in our extensive Offices, and we are prepared to attend to Patent business of all kinds n the quickest time and on the most liberal terms.

The Examination of Inventions.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submitit to us, with a full description, for advice. The points of novelty are carefully examined, and a reply written corresponding with the facts, free of charge. Address MUNN & CO., No. 37 Park-row, New York.

Preliminary Examinations at the Patent Office.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a Patent &c., made up and mailed to the Inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh-streets, Washington, by experienced and competent persons. More than 5,000 such examinations have been made through this office during the past three years. Address MUNN & CO., No. 37 Park-row, N. Y.

How to Make an Application for a Patent.

Every applicant for a Patent must furnish a model of his invention. If susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the government fees by express. The express charge should be prepaid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & Co., No. 37 Park-row, New York.

Caveats.

Persons desiring to file a Caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The government fee for a Caveat, under the new law, is $10. A pamphlet of advice regarding applications for Patents and Caveats, in English and German, furnished gratis on application by mail. Address MUNN & CO., No. 37 Park-row, New York.

Rejected Applications.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of the case, inclosing the official letters, &c.

Foreign Patents.

We are very extensively engaged in the preparation and securing of Patents in the various European countries. For the transaction of this business, we have offices at Nos. 66 Chancery-lane, London; 29 Boulevard St. Martin, Paris; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through our Agency.

Inventors will do well to bear in mind that the English law does no limit the issue of Patents to Inventors. Any one can take out a Patent there.

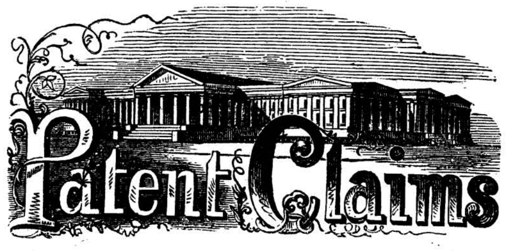
Circulars of information concerning the proper course to be pursued in obtaining Patents in foreign countries through our Agency, the requirements of different Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park-row, New York, or either of our Branch Offices.

Assignments of Patents.

The assignment of Patents, and agreements between Patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park-row, New York.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with Patent property or inventions to call at our extensive offices, No. 37 Park-row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park-row, New York.



ISSUED FROM THE UNITED STATES PATENT OFFICE

FOR THE WEEK ENDING NOVEMBER 12, 1861.

Reported Officially for the Scientific American.

THE PRINTING OF PATENTS ABANDONED.

The plan adopted by Commissioner Holloway of printing the specification which forms part of the Letters Patent, he has been obliged to abandon owing to the reduced receipts of the Patent Office. Hereafter, for a time, the specifications will be engrossed on parchment as formerly. This change will obviate the great delay which has attended the issuing of patents after sealing, but the papers do not go out looking so neatly. We hope the receipts of the Office will soon justify the extra expense which attended the printing.

*** Pamphlets giving full particulars of the mode of applying for patents, under the new law which went into force March 2, 1861, 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.

2,684.—D. B. Abbey, of Horse Head, N. Y., for an Improvement in Corn Planters :

I claim the swinging seed tubes, L, with the collars, g, fitted on them and provided with the furrow shares, O, in connection with stocks or bars, P, attached to the lower ends of the tubes, L, and provided with the covering shares, Q, all being arranged to operate as and for the purpose specified.

[This invention relates to an improvement in that class of corn planters which are designed for planting corn in check rows. The object of he invention is to obtain a machine of the class specified, which can be operated by a single person—the driver—no attendant being required to operate the seed slide.]

2,685.—Albert Anderson, of Bridgeport, Conn., for an Improvement in Roller Skates :

I claim the construction of wheeled skates with a large front wheel, D, substantially as shown and described, when the axis of said wheel is arranged above that portion of the stock which receives the ball of the skater's foot so that obstructions may be easily mounted, and so that the skater will be prevented from falling forward as described.

I also claim the construction and arrangement of the stock, A, so that its rear portion will be higher than the part which receives the ball of the foot, so that the weight of the skater will be partially thrown forward upon the large front wheel, and so that the skater will be prevented from falling backward; all as set forth.

[This apparently is a great improvement in roller skates, and will insure their general adoption. The character of the invention will be fully understood by the claim.]

2,686.—Silas Barker and A. H. Smith, of Hartford, Conn., for an Improvement in Water Meters :

We claim, first, The arrangement of the cylinder, A, and the hollow piston, B, said piston having an outlet, H, from one end.

Second, The combination of the piston, D, and valves, K K, said valves being on the end of the piston, D, and moved by the valve rod, F.

Third, The combination of the glass covering, L, on the piston, B, and the leather packing, M, in the center part of cylinder, A, said packing being kept fitted to the piston, B, by the springs, N, and held between the three parts of the cylinder, A A A, all as set forth and described.

2,687.—O. Billings, of La Grange, Ohio, for an Improvement in Grain and Grass Harvesters :

I claim, first, The attaching of the front end of the shoe, K, of the finger bar to the adjustable bar, N, which is connected by a pendent, P, to the lever, Q, as shown and described, for the purpose of regulating the hight of the front ends of the finger, e, as set forth.

Second, The arrangement of the spring lever, R, relatively with the lever, S, and finger bar, L, as shown and described, whereby the weight of the outer part of the finger bar and sickle is counterpoised, or nearly so, and whereby said finger and sickle may be raised bodily when required in order to pass over obstructions.

Third, The arrangement of the crank axle, E, of the track wheel, C, segment, G, and spring, H, substantially as and for the purpose set forth.

[The object of this invention is to obtain a grain and grass harvester which may be operated with but little side draught, the cutter or sickle allowed to conform perfectly to the irregularities of the surface of the ground, and at the same time admitting of being readily raised to pass over any obstacle which may lie in its path, while all the working parts are placed under the complete control of the operator.]

2,688.—Uriah Billings, of New Bedford, Mass., for an Improvement in Machines for Making Horseshoes :

I claim the combination of the goose neck, B, fixed die, C, and discharge aperture, f, with the forming mechanism, D E F G H, all constructed, arranged and operating as and for the purposes set forth.

The employment of the griper levers, J J, in combination with the traveling rollers, L L', and the extension arms, E' E', substantially as shown and described.

The combination of the vertical griping levers, J J, with the forming rollers, F F, and die, C, substantially as and for the purpose shown and described.

[This is an exceedingly simple and efficient machine for making horseshoes—one that may be operated with a moderate power and still capable of working rapidly and in a perfect manner.]

2,689.—Ransom Cook, of Saratoga Springs, N. Y., for an Improved Exhaust Fan :

I claim the construction of an exhaust fan in the manner substantially as described.

2,690.—Ransom Cook, of Saratoga Springs, N. Y., for an Improved Fan Blower :

I claim a fan blower, constructed substantially as described.

2,691.—J. M. Currier, of Newburyport, Mass., for a Substitute for Pins in Bowling Alleys :

I claim, first, The suspended pedals, A A A.

Second, The arrangement consisting of the devices, 1 2 4 and 5, for elevating the balls and depositing them on the inclined plane, 3.

Third, The devices for raising, adjusting and operating the number plates, N N N.

Fourth, The devices for raising the number plates, elevating and depositing the balls and recording the number of games played, all by a single operation as described.

Fifth, The dial, O, for recording the games as arranged and described in combination with a bowling alley.

Sixth, A bowling alley comprising the above devices constructed and arranged as fully shown and described in the specification and the drawings accompanying the same.

2,692.—Loyd Day and Milton Day, of Carrol County, Md., and Andrew Mercer, of Richmond, Howard County, Md., for an Improvement in Railroad Rails :

We claim a new and improved form of continuous railroad rail and a new method of combining the triangular bar with the chair or base bar for its reception with braces, supports or fastenings, substantially as described.

2,693.—K. H. Elliott and James Brown, of Morrisville, Vt., for an Improved Revolving Clothes Dryer :

We claim the frame, E, in connection with the lifting rope, H, clamp, J, swivel-eye, L, and block, D, the latter being connected to the horizontal arm, A, by the swivel connection formed of the pin, C, and hook, B, all arranged substantially as and for the purpose set forth.

We further claim the arrangement of the thimble, I, collar, g, and hub, F, with the knots, f h, on the rope, H, substantially as and for the purpose specified.

[The object of this invention is to obtain a revolving clothes drier which will admit of being suspended from a horizontal arm and attached to the side of a building or any proper support and be capable of being readily raised and lowered and secured at any desired hight, whereby it is believed the clothes may be more readily placed on and removed from the frame than hitherto, and the general manipulation of the device rendered extremely easy and attended with but little labor.]

2,694.—Lewis Face, of Covington, Ohio, for an Improved Washing and Wringing Machine :

I claim, first, The combination of the suds box, A, with the box or frame, B, the latter being secured to the former by hinges or joints, and said box or frame having the lever or hand frame, C, attached, which frame, C, is connected to the wash boards, C' D, by the rods, h h h' h', all being arranged as shown to admit of the elevation of the box or frame, C, when not required for use.

Second, The uprights, D D', attached to the sides of the suds box, A, the upright, D', being provided with the thimble, m', and crank, E, arranged substantially as shown and described, so as to grasp and hold the ends of the clothes and ensure the proper twisting or wringing of the same, as set forth.

Third, The adjustable box or frame, B, and washboards, C' D, arranged as shown in relation with the suds box, A, in combination with the wringing device formed of the uprights, D D', thimble, m', and crank, E, all arranged for joint operation, substantially as and for the purpose set forth.

[The object of this invention is to obtain a clothes washer and wringer so arranged and combined that little operations may be thoroughly performed, and with but a simple manipulation of the parts.]

2,695.—H. P. Gengembre, of Tarentum, Pa., for Improvement in Apparatus for Distilling Coal Oils :

I claim, the feeding and heating apparatus, consisting of the reservoir, B, pipe, D, heater, E, cock, b, and float, d, the whole applied in combination with each other, and with the retort substantially as and for the purpose specified.

And I also claim the tray, G, applied within the retort and in combination with a feeding apparatus, substantially as and for the purpose specified.

[This invention is intended more especially to be applied to apparatus for the distillation of petroleum, but is also applicable to the redistillation of coal oils. It consists in certain means of feeding the still, by which the oil is delivered there into at a high temperature as fast as the distillation proceeds so that the quantity in the still is always nearly the same, and by which the boiling over of the still is prevented.]

2,696.—H. B. Goodyear, of New Haven, Conn., for Improvement in Suspending Telegraph Wires :

I claim the method described of suspending telegraph wire of insufficient strength to support itself on poles set at usual distances apart, the same consisting in the use of an auxiliary iron wire or suspension cable and hanging the said telegraph wire upon it in the manner and or the purpose set forth.

2,697.—S. S. Hamill, of East Cambridge, Mass,, for Improvement in Railroad Switch :

I claim the arrangement of the pendulous frame, I, constructed as shown, with the axle, B, bed, A, rod, K, lever, L, spring, M, and rod, N, all as shown and described.

[This invention relates to an improvement in that class of switches which are employed for city or horse railroads, and which are actuated by the drivers of the cars, a small wheel being thrown in contact with an elevated central curved rail-quill when it is required to have the cars pass on a turn-out or branch track.]

2,698.—W. H. Gray, of Philadelphia, Pa., for Improvement in Epaulets :

I claim securing the detachable inner shell, B, having the fringe attached to the outer shell, A, by means of the strap, a, in the manner substantially as described, whereby the necessity of other fastenings for that purpose is dispensed with.

[This invention consists in a novel mode of attaching the fringe to the outer shell of the epaulet for facilitating the removal of the fringe when the shell requires cleaning, and when it is to be worn without fringe.]

2,699.—J. W. Hardie, of New York City, for Improved Construction of Knife and Fork :

I claim forming the knife handle and blade, and the fork handle and tines, respectively, out of a single piece of sheet steel, when the handles a re formed thereby in the usual shape and proportions of other knife and fork handles, and nearly inclose all sides leaving only narrow apertures, d f, therein, for the purpose of closely packing together and for readily cleaning, as a new article of manufacture, substantially as specified.

2,700.—W. J. Hazen, of Bethany, Pa., for Improvement in Moth Traps for Beehives:

I claim the worm trap, g, pivoted at one end to the bottom of the hive as described, and provided at the other end with the wire gage covered opening, and the grooves, 1 2 3 4, &c., radiating therefrom, arranged and operating in combination with the inclined bottom of the hive, in the manner and for the purpose specified.

2,701.—G. A. Higgins, of New York City, for Improvement in Camp Stoves:

I claim, first, The arrangement and combination of the stove, A, and adjustable flues, E I, substantially as and for the purpose specified.

Second, In combination with the stove, A, and adjustable flues E I, the broiling oven, H, and vessels, C, D, G, two or more, arranged as shown to admit of being compactly stowed away when not required for use.

Third, The employment or use in combination with the stove, A, of one or more supplemental ovens, K, when constructed, substantially as shown to admit of being readily detached and folded up when not required for use, and readily applied to the stove when required for use, substantially as set forth.

[An engraving and description of this invention will be found on page 328 of the present volume.

2,702.—J. B. Hyde, of Newark, N. J., for Improvement in Manufacture of Manure from Fish:

I claim the mixing of peat, marl, clay and plaster, or either or any of said material with fit pulp or pomace for effectually grinding or pulverizing said mixture.

2,703.—Charles Kaiser, of New York City, for Improvement in Machinery for Making Needles:

I claim the combination of the following members constituting a machine for grooving needle wire; viz., a rest for the needle wire, a rotating grooving saw, a traveling forceps and mechanism to cause the saw to approach and recede from the axis of the needle wire and to hold it in place, the combination as a whole being and operating substantially as described.

I also claim in combination with the above enumerated members, a second rotating grooving saw and mechanism to cause the saw to approach and recede from the axis of the needle wire and to hold it in place, substantially as set forth.

I also claim the combination of the first part of my invention with a stationary forceps or holder, substantially as set forth.

I also claim the combination of the third part of my invention with a pair of knives in such manner that the grooved needle wire is cut at the proper intervals into grooved needle blanks, substantially as set forth.

I also claim the combination of the first part of my invention with a support for the needle wire and with a straightening mechanism, substantially as described.

2,704.—G. R. Kelsey, of West Haven, Conn., for Improved Curtain Fixture:

I claim the curtain fixture, consisting of the roller fitted with its disks and caps, and operated by the coiled spring, ratchet-wheel, and spring ratchet, when the whole is constructed, arranged and fitted for use, substantially as described.

2,705.—J. B. Kendall, of Boston, Mass., for Improved Horseshoe:

I claim the auxiliary shoe, B, when provided with permanent heel and toe pieces, f, and g g, in combination with stationary shoe, A, both parts being secured together, substantially as and for the purpose set forth and described.

2,706.—J. W. Mackenzie, of Brooklyn, N. Y., for Improved Fire Escape:

I claim the round slotted tube-road, and traveling roller as shown in the drawings; and the arranged combination of fire and water proof tube-road and traveler with fire proof pendent tackle and iron mousing pin to hook as arranged and described, for the purpose of saving life and property, and the raising of hose and water to any part of the building, substantially as described.

2,707.—Emile Martin, of New York City, for Improvement in Self-Fastening Pins:

I claim a self-fastening shawl or dress pin constructed substantially as described, the pin being held firm and steady and secure by means of the guide tube, e, and spring fastening, h, or i, or equivalent combination.

2,708.—E. P. Russell, of Manlius, N. Y., for Improvement in Harvesters:

I claim, first, The attaching of the finger bar, J, to the main frame, A, by means of the shoe, K, provided with two eyes, h h', which are fitted on the oblique or diagonal-draw bar, L, the front end of which is connected by a joint or pin to the front left hand corner of the frame, A', and the back end fitted in a bar, M, the outer end of which is attached by a joint or pin, j, to the back part of frame, A, substantially as and for the purpose set forth.

Second, In combination with a shoe, K, and draw bar, L, constructed and connected as explained, I claim elongating the rear eye, h', of the said shoe in a vertical direction, to admit of a certain degree of play of the back part of the shoe and finger bar, and also of the platform when used.

Third, Attaching the driver's seat, O, to bars, P P, which are fitted at their lower ends in sockets, Q Q, attached to the frame, A, and arranged substantially as and for the purpose set forth.

Fourth, Transmitting motion to the sickle through the medium of a screw sleeve, D, adapted to be automatically thrown out of gear with its shaft by a backward motion of the machine, substantially as explained.

[This invention relates, first, to an improved mode of attaching the finger bar to the main frame of the machine. It also relates to an improved means for attaching the driving rod of the sickle to the crank or driving shaft. It further relates to an improved arrangement of the seat.]

2,709.—E. P. Russell, of Manlius, N. Y., for Improvement in Reels for Harvesters:

I claim, first, The arrangement and combination of the hollow or tubular shaft, G, of the driving pulley, c, the bearing, F, on the pin, E, and the sliding-reel shaft, H, substantially as and for the purpose set forth.

Second, Attaching the arms, e, to the reel shaft, H, through the medium of the metal heads, J J, formed each of two parts, f f', provided with radial grooves, g, having lips, i, bolted together by the bolts, h, and secured to the shaft, H, by the bolts, j, substantially as described.

[The object of this invention is to arrange the reel shaft in such a manner that it will play or work as the machine moves along, corresponding to the play or movement of the sickle produced by the latter, conforming to the inequalities of the surface of the ground.]

2,710.—C. H. Shank and S. Stephenson, of Hummelstown, Pa., for Improvement in Thrashing Machines:

We claim converting the machine either into an overshot or undershot thrasher, by means of the removable and convertible concave, E, and false concave, H, concave, G, and false concave, I, when respectively employed in connection with the cylinder, C, and feeding board, D, substantially in the manner and for the purpose specified.

2,711.—Thomas Slaight, of Newark, N. J., for Improved Padlock:

I claim, first, The employment or use of the dog, C, and guard bar, D, when the latter is provided with a prong, e, arranged in such relation with the lower part of the dog, C, that said dog may be actuated and thrown out or free from the shackle by the action of the key in unlocking the lock, substantially as described.

Second, The employment or use of the key catchers, k, one or more, arranged in connection with the tumblers, or formed on separate or special plates, to operate as and for the purpose specified.

2,712.—David Steinberg, of San Francisco, Cal., for Improved Mode of Setting Artificial Teeth:

I claim combining the teeth with the gold, platinum or other metal plate, by means of india rubber or other gum capable of vulcanization, applied in the manner specified.

[This invention consists in the combination of hard vulcanized india-rubber, with a gold platinum or other metal plate, as a base for artificial teeth, in such manner that the india rubber serves as a means of uniting the teeth with the plate, but is prevented from coming in contact with the palate and gums by the interposition of the plate, by which combination several important advantages are obtained.]

2,713.—Silas Stuart, of Sterling Center, Mass., for Improvement in Steam Boilers:

I claim the tube, A, and chamber, B, connected by the tubes, B', and forming the boiler and fire chamber, A', in combination with the jacket, E, and pipe, I, all arranged substantially as and for the purpose set forth.

I further claim the annular grate, J, when arranged to rise and fall, substantially as described.

2,714.—I. P. Tice, of New York City, for Improvement in Projectile for Rifled Ordnance:

I claim, first, The construction of a projectile for ordnance with its body composed of a single casting of iron and a surrounding ring of lead or other suitable material, capable of lateral expansion, when such casting is of such form that the force employed to ram it home, or the force to which it is subject in its discharge, will cause it be broken into two or more pieces, which will act in such manner as to cause the said ring to be expanded, substantially as and for the purpose specified.

Second, Constructing the two parts, A and B, of the projectile with collars, i and j, substantially as and for the purpose specified.

Third, The corrugated metal band, r, applied in combination with the packing ring, c, substantially as set forth.

2,715.—John Tustin, of Petaluma, Cal., for Improvement in Reaping Machines:

I claim, first, Connecting the swivel guide, H, to the upright, G, by means of a screw, p, passing through a nut or socket, o, on the upright, and provided with jam nuts, q q, substantially as shown, for the purpose of adjusting the shoe or rake, R, further forward or backward, on the platform, B, as may be desired.

Second, The arrangement and combination of the two bars, I J, and spring, L, with the guide, H, and crank, v, of shaft, M, all constructed and employed in the manner explained, to admit of the operation of the shoe or rake, K, on the platform, B, as set forth.

2,716.—G. W. Van Brunt, of Rolling Prairie, Wis., for Improvement in Seeding Machines:

I claim the arrangement of the rotating hubs, G, and sliding shells or cylinders, H, the latter being connected with the slide, J, having the tubes, Q, attached, substantially as and for the purpose set forth.

[This invention consists in an improved means for regulating the discharge of the seed so that the same may be sown in greater or less quantities over a given area, as may be desired. It also consists in an improved means for distributing the seed in a broadcast manner, and further in an improved arrangement of the cultivator or harrow teeth, whereby the whole of the latter may be raised simultaneously when desired, and any one of the teeth, when at work, allowed to rise and fall independently of the others, so as to conform to the inequalities of the surface of the ground.]

2,717.—Justus Baron Von Liebig, of Munich, Bavaria, for Improvement in Electroplating with Copper and other Metals, the Silvered Surfaces of Mirrors and other Articles for Protecting the Same:

I claim the use, in the galvano-plastic process of depositing upon silver or silvered surfaces, gold, copper, nickel or other metals of the neutral solutions of the metal to be deposited prepared with the double tartrate of soda, potash or ammonia, in the manner substantially as described.

Also, the mode hereinbefore described of coating the silvered surfaces of glass mirrors or other articles with a metallic film of gold, copper, nickel or other metals by the use, in the electroplating process of the neutral solution of copper, and the alkaline solutions of other metals, in the manner substantially as set forth.

2,718.—Frederick Walton, of Haughton Dale, Denton, England, for Improved Mode of Treating Drying Oils, for Manufacture of Varnish and other Purposes. Patented in England Jan. 27, 1860:

As an improved article of manufacture, I claim, first, A varnish as made by converting drying oil into semi resinous material, in manner as described, and then dissolving in a solvent, as stated.

Second, I claim the producing a semi-resinous material from drying oil by the combined process of exposing it in thin films, on a suitable surface, to currents of warm air and afterward separating it from the surface either by a solvent or by pressure, as described.

Third, I claim, in the production of the semi-resinous material, as described, the preparing drying oil by causing it to pass repeatedly in very fine streams through warm air, as described.

Fourth, I claim the producing, by rollers or otherwise, sheets of semi-resinous material, either alone or mixed with other substances, the said sheets being either combined with a woven or other fabric, or otherwise, as described.

2,719.—Enos Waterbury, of Stamford, Conn., for Improved Automatic Gates:

I claim, first, The arrangement of the sector, F, with a sliding weight, G, attached, toothed segments, d d, placed loosely on shaft D, arms, o o, attached to the shaft, D, and the plate, R, attached to the sector, F, the arms, o o, being connected to the segments, d d, which gear into the segments, c c, by the pins, p p, and the plate, R, connected to the arm, H', by the pin, t, substantially as and for the purpose set forth.

Second, The flap, g, connected with the shaft, D, as shown, in connection with the sliding rods, l l, on the gate, all arranged to operate as and for the purpose set forth.

[This invention relates to an improved gate of that class which is operated or opened and closed by the vehicle, the wheels of the latter as they approach and leave the gate actuating certain levers which put in motion the parts which open and close the gate. The object of the invention is to obtain a simple means for effecting the result, which will operate efficiently without being liable to derangement from slight casualties.]

2,720.—James White, of Cleveland, Ohio, for Improved Camp Bedstead:

I claim the pieces, D D, and cams, F, in combination with the side pieces, A A', head pieces, H H' and K, legs, B, and canvas, G, when these several parts are constructed, arranged and operated, as and for the purpose specified.

2,721.—J. M. Luther (assignor to W. E. Hartshorn), of Salina, N. Y., for Improvement in Process of Purifying Brine for the Manufacture of Salt:

I claim the introduction of bicarbonate of soda or salsoda into the brine in the manufacture of salt by the boiling process, either before or during the boiling process, substantially as and for the purpose specified.

[This invention consists in the introduction into the brine, in the manufacture of salt by boiling, of bicarbonate of soda or sal soda, for the purpose of neutralizing or expelling by precipitation the chlorides of calcium and magnesium which generally constitute the principal impurities in the brine.]

2,722.—Joseph Short, of New York City, assignor to Chas. Short, of Salem, Mass., for Improvement in Knapsack:

I claim the arrangement of the back and shoulder straps, E E, the neck strap, F, and the bottom straps, h h, the same being constructed and applied together and to the bottom of the knapsack, in manner and so as to operate as set forth.

2,723.—Turner Williams (assignor to himself and David Heaton, 2d), of Providence, R. I., for Improved Crank for Driving Sewing Machines and other Machinery:

I claim, first, Attaching the connecting rod, L, to two auxiliary pins, h, or their equivalent, instead of directly to the crank pin, d, substantially as shown and described.

Second, I claim the alternate connecting and disconnecting of the said auxiliary pins or an equivalent means of attachment to and from the crank pin, d, of a crank, in the act of turning such crank by means of a treadle or other device for the imparting a reciprocating movement, substantially as described, for the purpose specified.

2,724.—J. D. Woodruff, of Brooklyn, N. Y., assignor to T. B. Peck, of Yonkers, N. Y., for Improvement in Saddles:

I claim the arrangement, as described, and at a suitable angle of inclination to overhang and support the leg of the rider equally along their surface from top to bottom of the stops, 5, upon a riding saddle, substantially as described, and in such a manner as to secure the advantages set forth.

2,725.—H. S. Fisher, of Newburg, Pa., for Improved Means of Sealing Preserve Cans:

I claim the use of paper or other fibrous pallets, saturated and coated on both surfaces with a composition such as specified, in combination with a preserve can or jar, and with the cap, B, and retaining device, C, in the manner and for the purpose specified.

RE-ISSUE.

130.—E. A. Tuttle, of Brooklyn, N. Y., for Improvement in Registers and Ventilators. Patented June 19, 1856:

I claim the construction of the valves and plates with pins or projections, arranged to operate together, substantially as shown and described, without the use of any intervening parts or pieces, as set forth.

[The nature of this invention consists in the improved arrangement of the working parts of the ventilator, by which the partially rotating open or scroll front piece is made to operate directly upon and in contact with balanced or unbalanced valves, in opening or closing the register, dispensing with the use of connecting rods, links or other apparatus used in the construction of other ventilators or registers.]

DESIGN.

123.—J. A. Eshleman, of Philadelphia, Pa., for design for a Cravat.

FOR THE WEEK ENDING NOVEMBER 19, 1861.

2,726.—Nathan Ames, of Saugus Center, assignor to Parker and Perkins, of Meriden, Conn., for Improved Means of Attaching Forks, Spoons and Knives:

I claim, first, Confining to the blade and handle of any knife a detachable fork or spoon, or both, by the elasticity of the fork or spoon and knife blade, operating in combination with a button, b, slot, c pin, P, and hole, h, or their equivalents, substantially as and for the object specified.

Second, So applying and attaching a fork to a knife that one of the outer tines shall be flush, or a little more than flush, with the knife-edge, to prevent the latter from cutting when handled, or carried in a pocket, substantially as specified.

2,727.—J. W. Andrews, of Norristown, Pa., for Improvement in Gun and Bayonet Battery:

I claim, first, The bars, F and G, into which are secured a number of bayonets, g g, &c., and j j, &c., arranged, constructed and operated in connection with a carriage, substantially as and for the purpose described.

Second, I claim the combination of a number of guns and bayonets, fixed, arranged, and operated on a carriage, substantially in the manner set forth and for the purpose described.

2,728.—G. L. Baar, of Indianapolis, Ind., for Improved Scroll Saw:

I claim an endless saw, S, in combination with the two pulleys, D' D2, each propelled by the same belt, arranged as described.

2,729.—Simon Brooks, of Chester, Conn., for Improvement in Machinery for Bending Hooks and Staples:

I claim the bed piece, A, spindle, D, hinged arm, E, pivoted set or tool, F G, and clamping lever, H I, when combined arranged and operating in the manner and for the purpose described.

[This invention is designed for bending hooks and eyes, such as are used in hanging picture frames, looking glasses and other similar articles. It consists in a device for clamping and holding the blank while the hook or eye is being formed. It also consists in the manner of hinging the set whereby only one operation is required to bend and finish a hook or eye.]

2,730.—A. S. Carner, of Brooklyn, N. Y., for Improvement in Camp Chests:

I claim, first, The slides, O O', clasp, Q, and plug, Z, when the same are arranged in combination with the movable top, X, substantially as described.

Second, The slides, O O', movable top, X, and folding leaves, C C', when the same are arranged substantially as described for the purposes set forth.

Third, The slides, O O', movable top, X, when the same are arranged in combination with the hinged legs, D, and the straps, F, substantially as described.

Fourth, A trunk, with its parts arranged and constructed substantially as and for the purposes specified, it being susceptible of a ready conversion into a table.

2,731.—Lewis Eikenberry, of Philadelphia, Pa., for Improvement in Steam Slide and Cut-off Valves:

I claim the described method of adjusting combined working and cut-off valves relatively to the ports of a steam-engine cylinder, in combination with the specified operation of the same, for the purpose set forth.

2,732.—W. H. Elliot, of Plattsburgh, N. Y., for Improvement in Pump for Oil Wells:

I claim, first, The employment of an inner well or trap, in combination with the pump, as and for the purpose specified.

Second, The employment of floating valve, k, in combination with the pump, as and for the purpose set forth.

2,733.—R. B. Fitts, of Philadelphia, Pa., for Improvement in Army Feed and Water Buckets:

I claim the flexible rim, B, rigid bail, C, and plates, f f, the same being constructed and combined together with the flexible holder, A, so as to operate together, substantially in the manner described and for the purposes specified.

2,734.—John Gault, of Boston, Mass., for Improvement in Projectiles for Ordnance:

I claim, first, The combination of the hollow sectional projectile connected with a chain, or its equivalent, inclosed and carried within itself, and the charge regulated by the fuse, to extend its sections at any desired point, as set forth.

Second, I claim securing the sections of the projectile at its front end or point, with a cap or nut, or its equivalent, as described and for the purposes set forth.

2,735.—M. La Rue Harrison, of Burlington, Iowa, for Improved Mode of Applying the Bolster in Railroad Car Trucks:

I claim the employment of a swinging bolster, H, made in one piece, in combination with the pendulous stirrups, C C, springs, E E, alotted stirrups, F F, boxes, c c, and bolts, b b g g, all as shown and described for the purpose set forth.

[See engraving of this invention on another page.]

2,736.—A. Hoffman and H. W. Limebeck, of Halfday, Ill., for Improvement in Cultivators:

We claim the seed box, C, cam wheel, k, lever, f, harrow, e, teeth, b b b, and plows, q q and w w, when all are constructed and arranged, substantially in the manner and for the purpose set forth.

2,737.—Otis Howe, of Cambridgeport, Mass., for Improved Spring Bed Bottom:

I claim my improved mode of constructing the rocker and applying it to the bedstead or bed frame, viz., making such rocker with one or more legs, and constructing the bedstead or bed frame with one or more conical or flaring sockets, to receive, support and estop such leg or legs, in manner substantially as described, and enable such to vibrate longitudinally of the spring bearer, and to be raised out of such sockets, substantially as specified.

2,738.—W. L. Hubbell, of Brooklyn, N. Y., for Improved Means of Attaching Traces to Carriages:

I claim the cross bolt, c, applied to the eye, a, of the whiffletree, in the manner and for the purposes specified.

2,739.—Junius Judson, of Rochester, N. Y., for Improvement in Governors for Steam Engines:

I claim the swivel collar, h, revolving freely on the rod, b, between the fixed collars, j j, or their equivalents, so as to receive and turn with the ends of the governor arms, e e, and thereby obviate excessive friction and destructive wear, substantially as specified,

2,740.—D. S. Kimball, of Lowell, Mass., for Improvement in Carding Engines:

I claim my improved carding machine, having its parts constructed and made to operate together, in manner substantially as set forth, I also claim the application of the guards, c c, or their equivalents, to the sides of the screen, and so as to operate with the main card cylinder, in manner and for the purpose set forth.

2,741.—Thomas Lee, of Newark, N. J., for Improvement in Breech-Loading Firearm:

I claim removing the spent cartridge from its chamber by means of the arms, c c, pins, e e, and parols, a a, in combination with appliances, substantially such as shown, for opening and closing the breech, all essentially for the purpose and in the manner set forth.

2,742.—Elisha Matteson, of Brooklyn, N. Y., for Improvement in Projectiles for Firearms:

I claim, first, Making the base of the angular passage, B C C A', of the projectile in its transverse vertical section in the form of a section of a truncated cone, in the manner and for the purpose described.

Second, A cartridge formed of the improved projectile, A B C A', and the ordinary charged paper or bag case and a rubber band, in the manner and for the purpose described.

2,743.—Morris Mattson, of Boston, Mass., for Improvement in Enema Syringes:

I claim the connection, consisting of the perforated screw plug, m, on to which the connecting pipe screws, confining the bag between the pipe and the head, 5, of the plug, in the manner substantially as described.

2,744.—J. C. and C. N. Mayberry, of White Rock, Ill., for Improvement in Harvesting Machines:

I claim, first, The elevated yoke, E, connecting the linked rear rail, b, of the balanced frame, A, and employed in connection with the thrusting tongue, D, rope, F, and pulley, c d, substantially as and for the purposes set forth.

Second, The endless conveying and elevating apron, K, carried at one end in an inclined frame, L M, jointed midway of its length in standards, g, in the manner and for the purpose shown and explained.

[This invention relates to certain improvements in that class of harvesters in which the team is placed behind the frame of the machine, and an endless apron employed for discharging the cut grain. The object of the invention is to balance the machine more evenly than hitherto, cause the same to work steadier or with less vibration, equalize the draught, render the cutting device capable of being raised and lowered with facility, and enable the discharging apron to be adjusted to suit receiving wagons of different hights.]

2,745.—Wm. Morehouse, of Buffalo, N. Y., for Improvement in Lamps:

I claim the combination of the cylinder or case, D, tube, C, and plates, E F, arranged relatively, with the wick tube, B, and cone or deflector, E, to operate as and for the purpose set forth.

[An engraving of this invention will soon appear in our paper.]

2,746.—Wm. Morehouse, of Buffalo, N. Y., for Improvement in Sash Supporters:

I claim a sash retainer, constructed and operating in the manner and for the purpose set forth.

I claim constructing the bearings, d, of the box, E, plane-surfaced, and of a length greater than the diameter of the axle of the wheel, B, in the manner and for the purpose set forth.

I claim regulating the pressure of the roller, B, upon the sash rail, i, by means of the inclined shouldered brake, H, and tapered set screw, n, in the manner and for the purpose specified.

2,747.—L. H. Olmsted, of Binghamton, N. Y., for Improvement in Oilers:

I claim an oiler, made with a semi-spherical bottom, without seam, a flexible cover and a conducting wire attached to the extremity of the tube, all as shown and described.

[The nature of this invention consists in making the body of an oiler of semi-spherical form, so that no matter in what position it is placed, if left free to act of itself it will assume an upright position. It also consists in making the cover of the oiler flexible instead of the bottom or sides, thus bringing all seams above the oil in the can. It also consists in an arrangement of conducting wire to prevent waste of oil by running down on the outside of the nozzle every time the oiler is used.]

2,748.—H. J. Phillips, of New York City, for Improvement in Convertible Overcoat and Tent:

I claim a combined tent, overcoat and cape, made as shown and described.

2,749.—Charles Ray, of Boston, Mass., for Improvement in Stirrups:

I claim the application to the sides of stirrups of a revolving surface, however arranged, so as to prevent the feet of the rider from catching in the stirrups, in combination with a step or bottom having a fixed and non-rotating surface, and which bottom shall be rigidly attached to the frame of the stirrup, substantially as described.

2,750.—Addison M. Sawyer, of Fitchburg, Mass., for Improvement in Canister Shot for Ordnance:

I claim a canister shot, constructed in the manner substantially as described.

2,751.—Thomas Schankwiler, of Fayette, N. Y., for Improved Mode of Constructing Horse Powers:

I claim the arrangement and combination of the levers, c, draft rods, f, fulcrum bearing, d, socket, e, and connecting rod, g, substantially in the manner and for the purposes shown and described.

2,752.—W. G. Sherwin, James McFarland and Charles Thieme, of Cincinnati, Ohio, for an Improvement in Breech-Loading Ordnance:

I claim, first, The arrangements of a nipple, H I, at the bottom of a cartridge chamber, when in position for loading, so that the vent will be automatically closed, substantially as set forth.

Second, In combination with a faucet breech, which requires the charge in a vertical position, as explained, the projecting point or points, I, of the nipple, for the purpose of opening the cartridge by its own weight in the act of loading.

Third, The cock or capper, J J, adapted to perform the several offices of capping, firing and uncapping the nipple, together with holding the vibratory breech rigidly and exactly to its place while discharging, substantially as set forth.

2,753.—Aaron Shute, of Flushing, N. Y., for an Improvement in Fire-Escapes:

I claim the chain ladder, E, when connected to the building and to the tilting-box, D, and the latter provided with catches or levers, b b, arranged as described or in any equivalent way, so as to admit of the releasing of the box, D, and the liberation of the ladder, E, when required, and for the purpose set forth.

2,754.—David N. Skillings, of Boston, Mass., assignor to Himself and D. B. Flynt, of Cambridge, Mass., for an Improvement in Portable Houses:

I claim my improved portable house, having its framing constructed substantially as described, and the sides, ends and roof constructed in sections, as set forth, and applied to the framing in the manner specified.

2,755.—Charles Ward, of Salem, Mass., for an Improved Mode of Securing Knobs to Doors, Drawers, &c.:

I claim the described attachment for fastening on knobs or other articles, substantially as specified.

2,756.—S. L. Whetstone, of Cincinnati, Ohio, for an Improvement in Locomotives:

I claim the use in a locomotive of wheels applied to bear against opposite sides of a rail, in combination with wheels running upon top of the same rail, when the side wheels derive suitable pressure from the weight of the locomotive through a system of levers, or their substantial equivalents, as is fully represented.

2,757.—W. A. Wood, of Hoosick Falls, N. Y., for an Improvements in Rakes for Harvesters:

I claim, first, A jointed rake stale that will, in connection with an endless traveling belt, traverse the sides of the platform, and sweep therefrom, and deliver the cut grain, substantially as described.

Second, I claim connecting the jointed rake stale to the outer or grain side of the platform, so that the delivery point for the gavel may be next to, or at, or near the rear of the main frame, substantially as described.

2,758.—George Bradley, of Paterson, N. J., assignor to Jacob S. Rogers, of the same place, for an Improvement in Carding Engines:

I claim, first, Causing a stripping cylinder, C, covered with card clothing or equivalent material, which retains the strippings to be automatically operated against the main cylinder, so as to strip it during a certain period and then to be separated therefrom, and to be in turn stripped or cleaned by suitable mechanism, and to deposit the strippings separate from the fibers which are being carded, substantially in the manner and for the purpose described.

Second, Turning the stripping cylinder, C, slowly backward, or in the reverse direction to that in which it performs its function of a stripper, and thereby subjecting its surface to the action of the clearing comb, N, or its equivalent, in combination with a motion of the said stripping cylinder, C, to and from the main cylinder, substantially as and for the purposes set forth.

2,759.—D. H. Chamberlain, of West Roxbury, Mass., assignor to Himself and Alexander H. Twombly, of Boston, Mass., for an Improvement in Tubes for Surface Condensers:

I claim a surface condenser having its tubes strengthened by rings, as set forth for the purpose specified.

2,760.—W. E. Frost, of Clinton, Mass., assignor to Washburn & Moen, of Worcester, Mass., for an Improvement in Skirt Wire:

I claim a skirt wire, A, provided with an openly braided covering, B, when combined with a suitable size, or glazing, b, as set forth.

[This invention has for its object, first, economy in stock; second, rapidity of construction; third, an improved appearance when in a finished state; fourth, durability, and, fifth, a greater facility than usual in manufacturing the skirts.]

2,761.—John W. Lane, of Newton, N. J., assigner to W. and B. Douglas, of Middletown, Conn., for an Improvement in Pumps:

I claim the water chamber, or reservoir, C, in combination with the induction pipe formed of two parts, B and B so arranged and applied to the pump to operate as and for the purpose set fourth.

2,762.—E. C. Townsend (assignor to Smith & Browner), of New York City, for Improvement in Neck Ties:

I claim a neck tie made of paper, and adapted to the neck of the wearer, substantially in the manner described.

2,763.—Christian Weitman (assignor to himself, H. W. Glynn and A. Hageman), of Independence, Iowa, for Improved Device for Shrinking Tires:

I claim the plate, A, provided with a series of semicircular concentric holes, a, and pins, b, in combination with the chain, B, and lever, C, all arranged substantially as and for the purpose set forth.

[The object of this invention is to obtain a simple device whereby the tires of wheels may be shrunk so as to fit snugly and tightly to the wheels without the necessity of cutting and re-welding them, the invention admitting of ordinary persons, not mechanics, such as farmers teamsters, &c., setting the tires of their own vehicles when necessary without the aid of a mechanic.]

2,764.—G. F. Wilson, of Providence, R. I., for Improvement in Army Cooking Wagons:

I claim, first, Combining the above mentioned oven with an army wagon or other vehicle, substantially as described.

Second, The combination of the said oven or baker with either the boiler or broiling apparatus or both, and this combination with the wagon substantially as described, for the purpose of making a portable army cooking stove.

2,765.—Arnold Hamilton, of Broad Brook, Conn., for Improvement in Breech-Loading Firearms:

I claim the combination and arrangement of the sliding-charge chamber, C, with the conical-shaped chamber of the barrel, A, at its breech and the lever-toothed sector, F E, substantially as and for the purpose described.

RE-ISSUES.

131.—Wendell Wright, of New York City, for Improvement in Friction Clutches. Patented June 15, 1852:

I claim, first, Operating the friction segments to bring them into and out of contact with the inner periphery of the pulley by means of a connection with a sleeve, E, sliding longitudinally upon the shaft of the pulley, substantially as described.

Second, So supplying the friction segments in combination with the shaft hand pulley that the centrifugal force developed in the segments by their rotary motion, shall be allowed to force them outward against the inner periphery of the pulley, and so be productive of friction between the segments and pulley and made instrumental in or accessory to the transmission of rotary motion, substantially as described.

132.—[Re-issues Nos. 127 and 128, of October 29, were cancelled, and Nos. 132 and 133 issued in lieu thereof.] D. G. Littlefield, of Albany, N. Y., for Improvement in Stoves:

I claim an organization which temporarily confines the gases of the supply coal in a coal supply chamber, then burns the gases of the supply coal, and the gases of the incandescent coal laterally below and outside of the coal supply chamber, and entirely down to the grate and thereafter circulates the spent gases or a portion of them over the top of the coal supply chamber and between it and the outer wall of the stove, and finally discharges them through a flue leading outside the room in which the stove is situated.

133.—D. G. Littlefield, of Albany, N. Y., for Improvement in Stoves. Patented, Jan. 24, 1854:

I claim, first, The vertical wedge-shaped passages between the grate bars of the fire pot substantially as described.

Second, The employment of a grated fire pot forming a downward continuation of a coal supply pot, in combination with a gas-consuming chamber or flue between the outer case and the connected fire and coal supply pot, and an externally discharging spent-gas pipe, substantially as and for the purpose set forth.

Third, I claim an illuminated exterior wall, M, in combination with a coal supply chamber and an intermediate gas-consuming chamber, substantially as described.

DESIGNS.

H. G. Thompson (assignor to Hartford Carpet Company), New York City, for 15 patents for Designs for Carpet Patterns.

NOTE.—The number of applicants for patents is steadily augmenting and the Patent Office begins again to assume a busy aspect. Of the above list of patents, THIRTY-THREE of the number were cases, the specifications and drawings of which were prepared at the Scientific American Patent Agency.

TO OUR READERS.

Models are required to accompany applications for Patents under the new law, the same as formerly, except on Design Patents, when two good drawings are all that is required to accompany the petition, specification and oath, except the government fee.

INVARIABLE RULE.—It is an established rule of this office to stop sending the paper when the time for which it was pre-paid has expired.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

NEW PAMPHLET IN GERMAN.—We have just issued a revised edition of our pamphlet of *Instructions to Inventors*, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO., No. 37 Park-row, New York

Notes & Queries

C. G., of Mo.—The method practiced in the French cavalry in the Crimea, of securing their horses at night, was to stretch a strong rope along the ground, fastening it securely, and then tying the horse to it by one of his fore legs.

H. R., of Md.—We shall be happy to attend to the examination of your rejected case at the Patent Office. If the reasons for refusing your claims are unsound, which is not unusual, we can no doubt prosecute them to a successful issue, in spite of the rejection.

G. C., of Mass.—We advise you to have a preliminary examination made of your invention through the Patent Office. This examination is carefully made through our Branch Office, and will generally determine beforehand the novelty of your plan. As a precautionary measure we recommend it to inventors who intend to apply for a patent.

A. D. C., of Mass.—A cement of plaster of Paris should be able to stop the leak in your jar containing the silver solution. Apply a thin cement of the plaster on the inside, so as to fill up the crack.

H. W. C., of N. Y.—A gun has been constructed with a wrought-iron cylinder heated and suspended in a mould and molten cast iron cast around it, so as to form a partly cast and wrought-iron gun.

D. T., of Ohio.—You can obtain carbonic acid gas in large quantities by heating chalk in a clay retort up to a red heat. This is the cheapest mode of obtaining this gas known to us, but a more simple method consists in pouring sulphuric acid among chalk or marble dust. The acid combines with the lime and sets the gas free.

N. Van H., of Pa.—Beechwood boiled in linseed oil for about three minutes and fitted endwise in journal boxes, makes very durable and excellent bearings for the shafting of machinery.

P. S., of Mass.—You wish to know the cheapest solution that you can use for neutralizing sulphuric acid in your blocks of timber. A caustic alkaline lye made by stirring equal weights of common soda and fresh slacked lime in water, then allowing the sediment to settle to the bottom of the vessel, is the cheapest and best that you can use. The clear lye thus made is the well-known "washing fluid," and it is the lye that is employed for making hard soap by boiling oil or grease with it for several hours.

H. G., of N. Y.—The Commissioner of Patents has no power to annul an existing patent. He can order an interference to be declared between an existing patent and a pending application for a patent for the same invention, and then require testimony from each party in order to substantiate the question of priority of invention. If this is proved by the applicant for the pending case, the Commissioner exercises the right to grant the second patent.

H. D. P., of N. Y.—On page 356, Vol. III. (new series) of the SCIENTIFIC AMERICAN, you will find an engraving of President Lincoln's mode of buoying vessels over sand bars. It was patented May 22, 1849, and will expire the same month and day in 1863, unless he gets a renewal of his patent, which it is not probable he will do, We are not aware whether he is or is not the first President elected from the ranks of inventors.

D. J. C., of Mass.—The back pressure of the atmosphere on exhaust ports of an engine is in proportion to the size of the ports and it is the same relatively as it regards the size of the muzzle of a gun. The larger the area of muzzle in proportion to the bore of the barrel the greater, therefore, should be the recoil of the gun.

A. B. C., of C. W.—We do not know the address of the manufacturers of enameled cloth for carriage top but the article is made in Newark, N.J.

E. D. H. of C. W.—The McNary Knitting Machine Co., No. 25 William street, have patents for knitting stockings complete. Address also, J. B. Aiken, of Manchester, N. H.

R. W., of Ill.—We are not acquainted with the proportions of the ingredients used in making Arnold's writing fluid. It has never been patented, and is therefore kept secret from the public.

G. P., of N. Y.—Lead one-eighth of an inch thick will resist the pressure of steam, provided the pipe is small enough. The larger the pipe the thicker must the lead be. Iron is better.

W. B., of Iowa.—Make the area of the chimney of your steam boiler equal to that of all the flues, carry it up 40 feet high, make the inside smooth, with a good coat of plaster and you will obtain a good draft. There are no fears of the chimney drawing if it is kept warm and dry.—There is a great variety of opinions among millers respecting the best dress of burr stones. Study those which have been illustrated in the SCIENTIFIC AMERICAN. See page 192, Vol. 4, present series.

L. C. R., of N. J.—The flooring of a basement with a cellar underneath should endure as long as that of any other floor if you maintain a circulation of air underneath. It you char the joists of such flooring by slightly burning them they will last much longer Hot pitch, or a solution of sulphate of copper, applied to the joists and flooring will also tend to render them more enduring.

Money Received

At the Scientific American Office on account of Patent Office business, during one week preceding Wednesday, Nov. 27, 1861 :—

A. H. W., of Vt., $20; E. B., of Conn., $20; C. W. L., of N. Y., $20 J. W., of Conn, $20; H. H. D., of Conn., $20; T. M. C., of Mass,, $25; T. & Bro., of Conn., $20; G. W., of N. Y., $15; C. W. S., of N, Y., $20; J. T. H., of Cal., $19; I. De H., of Pa., $25; O. N. B., of Iowa; $15; L. D. C., of Mich., $25; J. C. N., of Pa., $15; P. and T., of Md., $275; J. W. F., of Pa., $55; J. B. & Co., of Ill., $15; N. P. E., ot N. J., $22; J. B. R., of Mich., $30; E. M. and J. E. M., of N. Y., $20; F. W. W., of Mass., $15; E. K., Jr., of N. Y., $20; W. C. K., of N. Y., $20; C. H. B., of Pa., $25; E. and P., of N. J., $20; W. H. B., of R. I., $15; W. R. S., of N. Y., $15; E. M., of N. Y., $10; A. Y., of O., $10; E. P., of Cal., $20; E. R. O., of O., $25; S. and L. A. D., of R. I., $15; I. L. H., of R. I., $15; A. S. F., of N. Y., 25; S. H. and H., of Mass., $30; S. G. B., of Conn., $25; W. H. S., of Conn., $45; A. J. B., of Mass., $43; H. K., of Conn., $20; W. H. J., of N. Y., $20; L. A., of Mass., $20; F. W. W., of N. Y., $20; B. H. H., of N. Y., $63; T. C. B., of Vt., $15; W. M., of Mass., $15; T. G., of Ill., $25; E. M. S., of N. Y., $15; E. C. M., of N. Y., $15; H. C. S., of Me., $25; M. S. and S., of N. Y., $15; D. W. W., of Conn., $15.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Nov. 20, to Wednesday, Nov. 27, 1861:—

T. M. C., of Mass. ; C. W. S., of N. Y.; C. H. B., of Pa.; B. H. H., of N. Y.; A. Y., of Ohio; I. DeH. of Pa.; T. A. G., of Ill.; J. S., of N. Y.; L. D. C., of Mich.; J. B., of Cal.; S. G. B., of Conn.; C. T. V, of Pa.; C. D. J., of France; I. L. H., of R. I. (2 cases;) W. W. W., of Ill.; H. C. S., of Me.; A. S. F., of N. Y.; A. J. B., of Mass.; W. B., of N. Y.; A. B. H., of Conn.; J. C. N., of Pa.; W. H. B., of England; E. M. S., of N. Y.; E. R. O., of Ohio: E. E., of Cal.; A. S. F., of N. Y.

RATES OF ADVERTISING.

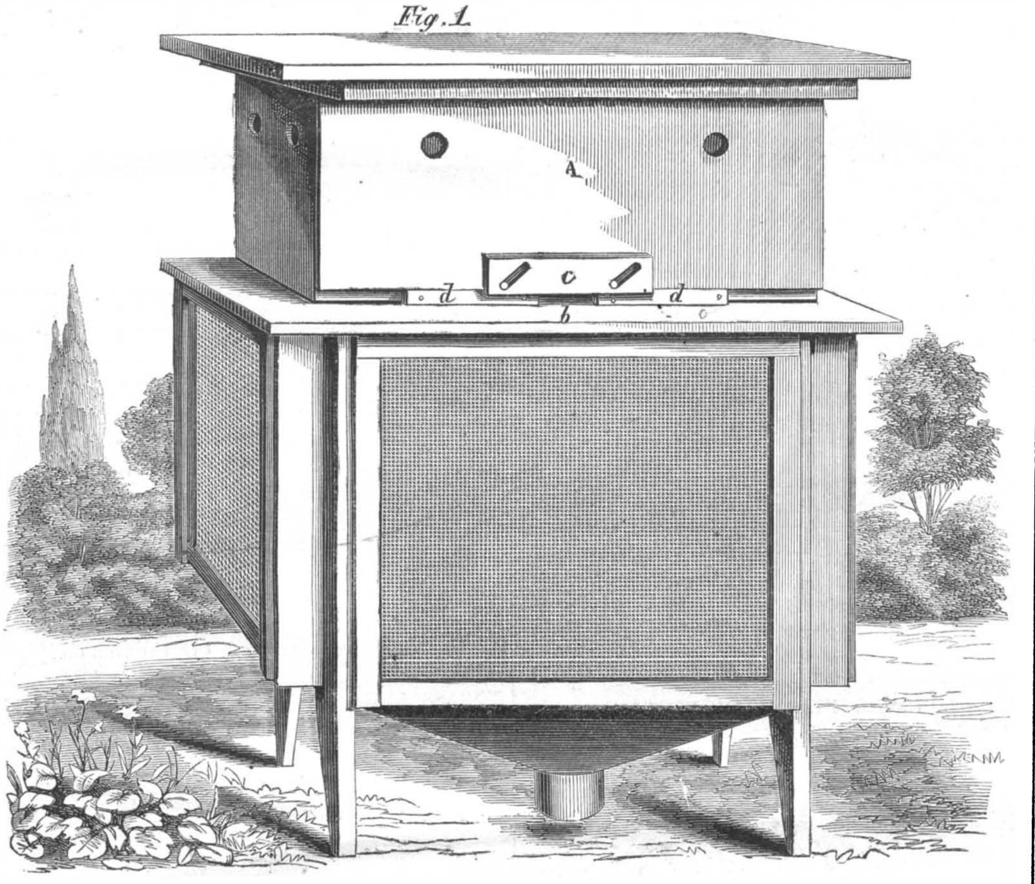
Thirty Cents per line for each and every insertion, payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns; and, as heretofore, the publishers reserve to themselves the right to reject any advertisement they may deem objectionable.

What a Bee Keeper has Observed.

It is found that a bee hive requires to be ventilated and at the same time to afford protection from the cold. Both of these desiderata are secured in the hive represented in the annexed engravings.

Each wall of the hive is made of two sheets of wire cloth—say one and a half inches apart—with the space between filled with straw. This porous structure admits of the most thorough ventilation, and perfectly protects the bees from the cold. The outer sheet of wire is attached with screws so that it may be readily removed with the straw for the purpose of examining the interior of the hive. The bees are then seen through the meshes of the inner cloth. The inner sheet is also secured in a way to permit it to be taken out for convenience in removing the comb.

Fig. 1



SMITH'S IMPROVED BEE HIVE.

The hive is represented in Fig. 1, and the wire frame in Fig. 2. A is the top box that covers the honey boxes, ventilated and chamfered at the bottom to insure a closer fit to the hive, and also to avoid crushing bees in putting it on, as well as to leave no place for the miller to deposit its eggs. The size of the entrance, *b*, may be regulated by the board, *c*, which is secured to the front of the top box by screws passing through the inclined slots in the boards, so that by pushing the board endwise it may be varied at will. The opening may be closed entirely by pushing together the blocks, *d d*.

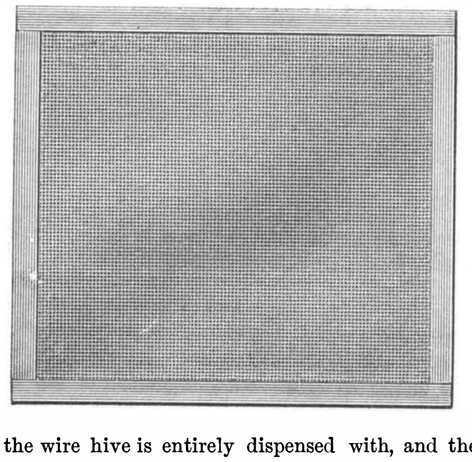
The bottom of the hive is made in the form of an inverted pyramid, with an opening at the center, which is closed by means of a tin cup that may be removed to throw out the dirt produced by the bees.

In relation to this hive the inventor says :—

"Since I have been using my wire hives I have learned so much of the ingenuity and cunning of the honey bee and also of the bee moth, that I am persuaded that all the bees need to protect themselves from the destructive work of the moth, is a good and healthy hive, one that is protected from the exterior, so that the moth can find no place to deposit its eggs and have them hatched by the warmth of the bees or sun, and where the young worm can find no food on which to subsist until it finds its way into the hive. If bees are placed in a poor hive they know it as well as, and sometimes better, than their masters, and very frequently become disgusted and leave for the woods. But if placed in a good hive they will manifest their knowledge of its worth to them by their energetic labor and faithful watch over the entrance at night. The miller finds no admittance there, and if it cannot find a suitable place to deposit its eggs in some crack or crevice in the hive, it will sometimes attempt to force its way in against the guard at the entrance. I have often seen it caught and torn to pieces by the bees while attempting this forcible entrance.

"Since I have placed my bees in the wire hive they have become so strong and healthy that I do not have much concern about the bee moth. These hives are tight and yet admit of a uniform ventilation, so that if the entrance is entirely closed the bees do not suffer for want of air ; neither do they become alarmed, as is often the case in some hives, under the excitement of which they generate heat and soon perish. I have at times seen my bees so completely close the entrance of their hive that it would be impossible for the miller to enter, which they could not do in a common wooden box hive without smothering the inmates. In such a hive they are obliged to keep up a constant fanning all night long as well as during the day, in order to supply their home with fresh air. This labor

Fig. 2



in the wire hive is entirely dispensed with, and the bees being at all times kept dry and healthy, are able to defend themselves against their common enemy, the bee moth.

"Some persons thought that the first thing the bees would do on being placed in the wire hive would be to gum up the meshes, but my experience has convinced me that the bees will gum the wire only where they attach their combs and around the edges where it is attached to the frame, unless the light is admitted to the hive or it is so poorly made as to admit the entrance of ants. The bees will not spend time to gum it and thus deprive themselves of a good and regular ventilation ; indeed, they would remove the gum in order to get more air if by any circumstance they were induced to gum it. This I have tested the past summer.

"I have learned more of the nature and habits of this little insect this past year than I was ever able to do before. My hive admits of a close examination without disturbing the bees, and while they are busy at work in the summer I can take my seat at the side of a hive and observe the operators as long as it seems profitable. I can go from hive to hive and by simply withdrawing the sash containing the straw, look at any side of my hive without arresting their labor. It is not like a glass hive in this respect, for in that the bees must be more or less of their time engaged in fanning their hives to supply themselves with fresh air, and to keep the hive dry. In the wire hive there is another advantage over the glass ones, in the fact that no obstruction is offered to a perfect observation of the interior of the former, which is precluded in the latter from the moisture that gathers on the glass. It is also always clean, and the bees can hold on to it and run over it with ease, which is not the case with glass.."

The patent for this invention was granted through the Scientific American Patent Agency October 15, 1861, and further information in relation to it may be obtained by addressing the inventor, A. J. Smith, at Decorah, Iowa.

FROM THE STEAM PRESS OF JOHN A. GRAY.