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USEFUL RECEIPTS.

Collecting Vinegar from Wood.

Acetic acid is met with among the products from the distillation of wood, and is combined with steam, tar, and gases, such as the oxyde of carbon, hydrogen, and carbonic acid. If, in collecting the acetic acid, the smoke that contains it is conducted into refrigerators, the steam and the greater part of the tar are condensed at the same time, the consequence is, that the vinegar thus obtained is diluted with a large quantity of water and mixed with impurities. For most purposes this acid requires to be purified and concentrated; the following process, which is taken from the "Genie Industriel," is a French invention, and consists in exposing to the vapors of acetic acid during the carbonization, a substance that has an exclusive affinity for it, and which consequently concentrates it. The substances that comply with this condition are the bases whose acetates are not decomposable at the temperature employed, namely, potassium, soda, barytes, lime, magnesium, &c., and the carbonates of these bases or of any other salt whose acid can be displaced by vinegar. Of these bodies, preference should be given according to localities, to lime or the carbonates of lime, magnesium, and soda, the former on account of their cheapness, the latter because it would give directly the acetate of soda a product that is at least employed for the complete purifying of the vinegar. This process is applicable to any method of carbonizing.

There are but few places in our country where wood vinegar is made; we know of only one, (Berkshire, Mass.,) there may be others, however. It is used as pyroligneous acid, and employed for the red and black liquids for calico print and cotton dyeworks; the black liquor derives its name from the iron in it, which gives it the said color, and it is used for printing and dyeing cotton blacks.

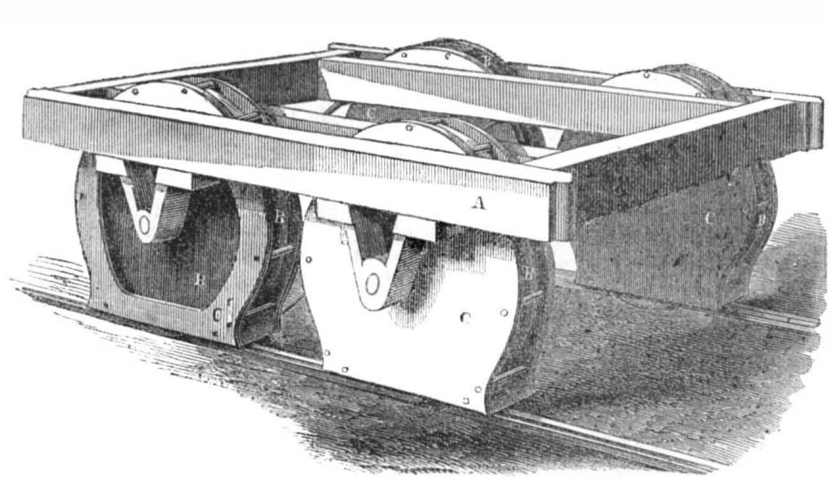
Looking Glasses.

Glass for mirrors is sometimes tinned instead of being silvered. M. Gulley, of France, has invented a process by which the tin is protected from injury by means of a coat of metal. It is done in the following manner:—Lay a coat of varnish on the tin, and over this another of plumbago, when dry place the glass immediately in a vessel containing a solution of sulphate of copper, a battery arranged in the usual manner is applied to this solution, and by this means a coat of copper is deposited on the tinned side of the glass.

The Sardine Fishery.

During the past year five hundred and seventy-six millions of sardines have been taken in nets on the coast of Brittany, France, which extends two hundred miles. Half of them are to be put down in oil. One hundred and sixty vessels, manned by five thousand five hundred sailors and fishermen, are engaged in the trade. The preparation, transport, and sale of the fish, employ ten thousand persons. Nine thousand of these are occupied all winter in the making and mending of nets.

SAFETY RAILWAY TRUCK.



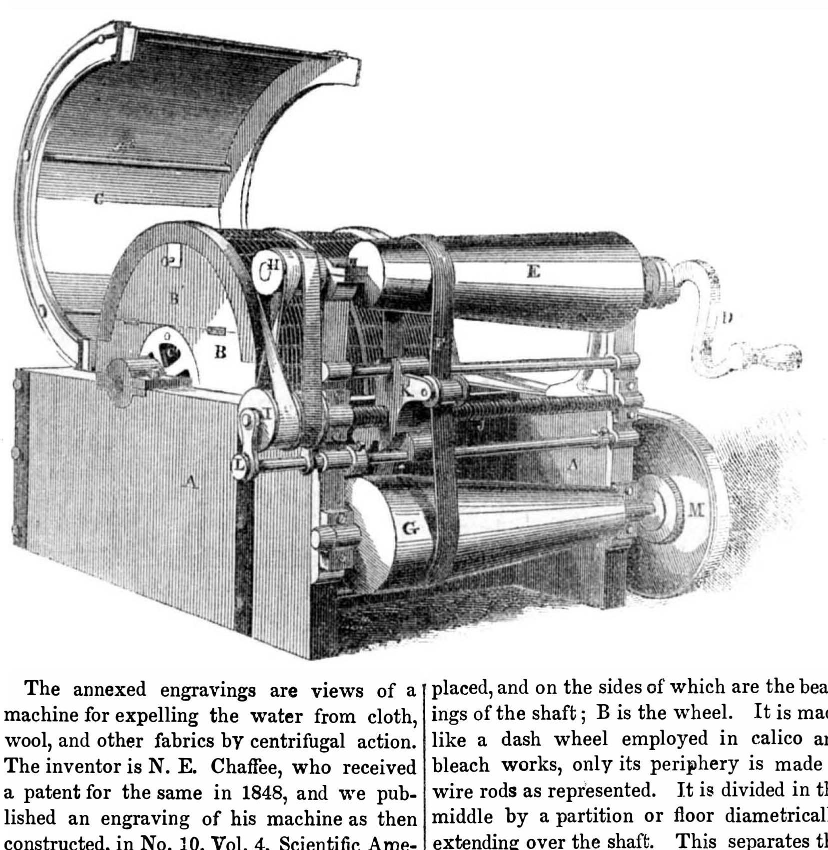
The above engraving represents a truck for railway cars eminently adapted for the prevention of the dreadful accidents that generally happen when a wheel or axle breaks. No person, who only even glances at this contrivance, can fail to understand its efficiency for the purpose indicated, and a brief description will thoroughly explain its intention.

A represents the usual framing, which secures the different parts firmly together. B B are the wheels, which are four in number, two to each axle. So far the truck is identical with the one usually adopted on railroads but the peculiarity that makes it to differ from all others, consists in the employment of a metallic casing, which surrounds each pair of wheels, and also the axle, so effectually, that, should either the axle or the wheels (or even both) break, no untoward result will occur, but the car can continue its career with perfect impunity. This metallic casing for the wheels may be either a complete or partial covering, as desired. In the one instance the wheels will be as represented, entirely covered by the casing, C, and in the other only partially so by the casing, C′, when the wheel B, will be exposed to view as shown here.

Each axle is also surrounded by a metallic tube which is firmly attached to the wheel casing at its extremity. This arrangement allows of a separate axle to each wheel, if such a mode of construction should appear desirable. In case a wheel may happen to break, it is hardly possible for it to come in twain, but even if such a casualty occurs, the wheel casing, from being flat at the lower part, will find a bearing on the rail and thus support the car.

For further particulars respecting this invention which was patented last year, application to be made by letter or otherwise, to A. L. Finch, Britain, Ct.

CHAFFEE'S PATENT DRYING MACHINE.---Figure 1.

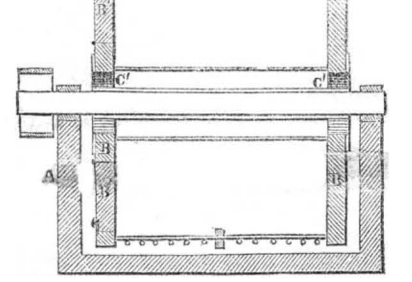


The annexed engravings are views of a machine for expelling the water from cloth, wool, and other fabrics by centrifugal action. The inventor is N. E. Chaffee, who received a patent for the same in 1848, and we published an engraving of his machine as then constructed, in No. 10, Vol. 4, Scientific American. Those of our readers who have that volume will perceive that the present engraving presents features in the machine which have made it operate in a superior manner, and have rendered it more valuable. Figure 1 is a perspective view, and figure 2 is a transverse vertical section of the revolving wheel, which contains the wool or wet goods.

A is a frame or arc in which the wheel is placed, and on the sides of which are the bearings of the shaft; B is the wheel. It is made like a dash wheel employed in calico and bleach works, only its periphery is made of wire rods as represented. It is divided in the middle by a partition or floor diametrically extending over the shaft. This separates the wheel inside into two chambers. Dyed cloth either woolen or cotton, or any kind of wet goods are placed in these chambers, and the wheel set in motion like a dash wheel. The particles of moisture, owing to their fluid nature, are thrown out of the goods by centrifugal action, and in a very short period they are rendered quite dry. There are a number of metal rods, figure 2, which extend from side to side, across the machine, over the shaft; they are arranged in the form of a small arch. They keep the goods off the partition, and air is admitted under them from the outsides through the central openings, C′ C. Figure 2 shows the said rods and the central openings. This arrangement is new and greatly facilitates the operation of drying. The goods, &c., are put in and taken out by doors in the sides, which are held fast by spring latches. The emptying and filling of these chambers are performed in the same way as those of the dash wheel; C is a cover to prevent the water from being thrown about outside.

The rest of the machinery is for driving the wheel by differential pulleys, to give a fast and slow motion as may be required; M is the pulley from which a belt runs over a pulley on the wheel shaft, and drives the wheel. The cone pulley, G, receives motion by a belt, F, from cone pulley, E, which is driven by a belt from a water wheel or steam engine.—The handle, D, is put on merely to show how motion is communicated; H, I are two pulleys, the top one driving the lower one, which is placed on the end of a screw-shaft J, on which is a travelling shipper K, that guides

FIG. 2.



and directs the belt, F, to vary the velocity of the wheel. It is best to commence with the slow motion when the wheel is heavily loaded and gradually increase the speed, the shipper, K, guides the belt F, from the large to the small end of the cone pulley, G, thus gradually increasing the speed from the minimum to the maximum. The shipper is guided on the rod, L. This is a very excellent machine, and the different parts are well arranged. The screw, J, moves the shipper, K, to one side or other according as the screw is moved. This is done by throwing either of the two small belts on the double pulleys, H I, in and out of gear, by drawing out and pushing in the pully I, which slides on a feather.

More information may be obtained by letter addressed to Chaffee & Halladay, manufacturers, Ellington, Conn.

Powers on Cleaning Marble Statues.

Allow no one to touch them, for the oil on the skin will discolor the marble. In cleaning, be sure to use pure cold water only; and wash with a painter's small brush. To brush off dust, use a fly-flap made of peacock's feathers. Cover the marble in summer with gauze to keep off the flies. If any flies should get to it, use alcohol to remove the blemish, and on no account use soap or warm water. The light should fall on a statue or bust from such a height as to leave a hair's breadth between the shade of the nose and the upper outline of the upper lip.—[Courier & Enquirer.

[By experience, we can say that cold, clean soap suds is the best,—then wash them off with cold water.]

A rich vein of lead has been discovered in Campville, Tioga Co., N. Y. The editor of the "Oswego Gazette" has been shown specimens of the ore, yielding 90 per cent.

The Canada "Land Company" (England) have declared a dividend of 6 per cent. on the half year.

MISCELLANEOUS.

[Reported expressly for the Scientific American.]

Lectures on Chemistry.---No. 4.

[An abstract of a Lecture on "Potassium and its Compounds," delivered before the Mechanics' Institute, at Cincinnati, Ohio, by Prof. Chas. W. Wright.]

Potassium is obtained by heating a mixture of carbonate of potash and charcoal to whiteness in an iron retort. The potassium is condensed in a copper receiver, kept cool by being surrounded by a freezing mixture, and which contains naphtha or rock-oil, into which the melted potassium drops, and is preserved from the action of the oxygen of the air.

Potassium is a brilliant white metal, with the lustre of polished steel; and is so soft that it can be moulded by the fingers, and can be readily cut with a knife. It melts at 150°, and is so light that it floats upon the surface water. On exposure to the air it is instantly tarnished, being converted into oxide of potassium, or what is chemically termed "Potassa." When thrown upon water it bursts into a beautiful purple flame, forming a solution of potassa, which has an alkaline re-action. In this experiment the combustion is due, in part, to the potassium combining with the oxygen of the water, it having the power to decompose that liquid; hence it is kept under the surface of naphtha, a liquid which contains no oxygen.

The equivalent, or combining number, of potassium or "kalium" is 39 19, and its symbol, K.

Hydrate of Potassa—water combined with the oxyde of potassium, $K.O\ H.O.$—This substance is obtained by boiling 10 parts of carbonate of potash in 100 parts of water, and adding little by little, 8 parts of recently slacked lime. After boiling a short time it is allowed to cool, when the carbonate of lime or chalk subsides to the bottom of the vessel. When properly prepared, the clear liquid does not effervesce on the addition of an acid. The whole operation must be conducted in a covered ~~vessel, so as to~~ exclude the air. When evaporated to dryness, and melted, and run into moulds, it constitutes the "potassa fusa" of the drug stores; when in solution it is termed "liquor potassæ."

Potassa, or caustic potash, is deliquescent, and rapidly absorbs carbonic acid from the atmosphere, and must be preserved in well stoppered bottles. It readily attacks and dissolves the skin, and is highly poisonous. The antidote is vinegar or sweet oil.

With the fixed oils, potassa combines and forms a class of salts commonly called "soaps." Most of the fats and oils consist of oleic, margaric, and stearic acids, combined with an organic base, "glycerine;" potassa being the stronger base, combines with the fatty acids, forming salts or soaps, which, when potassa is the base, are soft, but if soda is the base they are hard.

Carbonate of Potassa, $K.O.C.O.$—This compound is always obtained by lixiviating or leaching wood ashes. Carbonate of potash, however, never exists as such in plants, the potassa being in combination with some vegetable acid, as oxalic, citric, tartaric, &c. When the plants are burned the vegetable acids are converted into carbonic acid, which, combining with the potassa, forms the carbonate of potassa, or what is commonly termed "potashes." The branches of trees yield more than their trunks, shrubs next, and herbs and leaves still more, on incineration. This distribution is probably due to the saline matter existing chiefly in the juices of the plant. Certain plants, as wormwood, for example, yield more carbonate of potassa, when burned, than others. Organic acids, when combined with potassa, undergo the same change when taken into the systems of animals, that they do when burned in the air, being converted into carbonic acid, which, uniting with the potassa, is thrown from the system as carbonate of potassa.

Nitrate of Potassa, Nitre, Saltpetre, $K.O.N.O^5$.—In the decomposition of animal matter containing nitrogen, in contact with alkaline bases, nitric acid is always formed, which, combining with the bases, generates that class of salts called "nitres," or the "nitrates." Nitric acid is probably formed in all cases by the oxydation of ammonia, which is the nitrogenous compound evolved in all cases of putrefactive decomposition. Thus, eight equivalents of oxygen and one of ammonia yield one equivalent of nitric acid and three equivalents of water. This change will be more intelligible when expressed in the form of a rationale, thus:—$N.H^3.+L.O.=N.O^5.+3H.O.$

In certain districts in India, nitrate of potassa appears to be formed in the soil in this way, and is obtained by leaching the earth taken from such localities. In some countries this natural process is imitated by keeping decomposing animal matter and lime together, whereby the nitrate of lime is generated, and decomposed by being lixiviated with carbonate of potassa, by which the nitrate of potassa and carbonate of lime are formed. Thus:— $Ca.ON.O^5.+K.O.C.O^2=K.O.N.O^5.+Ca.O.C.O^2$. Nitrate of lime exists naturally in certain caves, and is converted into nitrate of potassa when treated in the manner above mentioned. At the Mammoth Cave, in Kentucky, nitrate of potassa was once obtained in this way. This cave is the resort of innumerable bats, which, by their death and decay, will account, in part at least, for the presence of nitrate of lime.

Nitrate of potassa readily parts with its oxygen at an elevated temperature, and, from its containing a large quantity of that element, is extensively used in the manufacture of deflagrating mixtures, as gunpowder &c. The ingredients of gunpowder are sulphur, charcoal, and nitre. The sulphur accelerates the combustion and generates most of the heat, while the combustion of the charcoal furnishes carbonic acid gas, which, by occupying much greater space than its constituents, before combustion, produces much of the force of the explosion. The following rationale will give an idea of the re-action of the constituents of gunpowder produced by their explosion:—$3C.+K.O.N.O^5+S.=3C.O^2.+K.S.+N$; three equivalents of carbonic acid, one of sulphide of potassium, and one of nitrogen gas, being the result of the deflagration. Gunpowder, when ignited, does not explode instantaneously, but the combustion is communicated from one particle to the next until it is entirely consumed. Bodies which explode instantaneously are not adapted for the movement of projectiles, their action not being productive of a sustained effort, is local, and would tend as much to shatter the fire-arms as to project the ball. Gunpowder, when struck violently, sometimes explodes, and fatal accidents are occasionally the result of inattention to this fact. Fire-arms are sometimes burst by being discharged when the ball is not in contact with the charge of gunpowder—when it is not "rammed home," as the phrase is. This is cause by the great expansion of the air which is contained between the ball and the charge, and which undergoes so great dilatation, in connection with the deflagration of the powder, as to burst the piece.

Chlorate of Potassa, $K.O.Cl.O^5$.—This salt is obtained by transmitting a stream of chlorine gas into a solution of potassa. Six equivalents of chlorine, and six equivalents of potassa, yield one equivalent of chlorate of potassa, and five equivalents of chloride of potassium, one equivalent of the chlorine being converted into chloric acid, by abstracting five equivalents of oxygen from five-sixths of the potassa, used in the experiment, the chloric acid combining with the remaining equivalent of potassa, forms the chlorate of potassa, and the five remaining equivalents of chlorine and potassium, combining from five equivalents of chloride of potassium. These salts are separated by crystallization. The following is a rationale of the process:—$6K.O.+6Cl.=K.O.Cl.O^5.+5K.Cl.$

When mixed with combustibles, this salt deflagrates with much more violence than saltpetre. It was at one time used in the manufacture of percussion caps, as a mixture of it and sulphur detonates violently when struck by a hammer. Chlorate of potassa is used as an oxydizing agent in calico printing, and for the preparation of pure oxygen gas.

Iodide of Potassium, $K.I.$—This substance is obtained by decomposing the iodide of zinc with an equivalent quantity of carbonate of potassa; carbonate of zinc and iodide of potassium being the result of the decomposition, thus:—$Zn.I.+K.O.C.O^2.=K.I.+Zn.O.C.O^2.$

Iodide of potassium is extensively used in medicine, and has been recently employed in the preservation of butter; but as it is no way superior in this respect, to common salt, and and possesses a poisonous action, when slowly introduced into the system, for a considerable length of time, by producing glandular absorption, its employment for this purpose should be staictly avoided.

The Atmosphere, and its Effects upon Animal Life.

A very interesting lecture was delivered on the 11th inst., by Dr. Griscom, at the New York Mechanics' Institute, on the "Influence of Air in connection with Animal Life." The lecturer commenced by saying that he supposed some of them would be surprised to hear that they lived at the bottom of an immense ocean of air fifty miles deep; yet it was so, and the color of this ocean, which is called the atmosphere, is a deep cerulean blue. To perceive this color it was necessary to be able to see at once the whole volume, and also on a calm and clear day, for no color could be perceived if seen in small quantities, or when there was either wind or haziness. In like manner the color of water could not be seen in small quantities, and was only perceptible where there was a vast expanse of ocean. The air was also a substance capable of condensation and expansion. Its expansion was seen in the winds, by which ships were made to traverse the ocean, and also in windmills. The tornado was another phase of its expansion, by which trees were uprooted and houses overturned, and was almost equal to the power of steam. The greatest weight of the atmosphere was fifteen pounds to the square inch, and this weight presses on every way, both upward and downward. To explain the pressure upwards, the lecturer exhausted the air out of a large vase, which then remained fast to the plate on which it stood, but on the air being let in it was easily removed. I remember, said he, being asked the question, if there is a pressure of fifteen pounds to the square inch, the reason why we were not at once crushed by the weight; but this is, as I before explained, because the air presses in all directions with the same force, and hence there is an equilibrium.—This is a most important element, and one which requires to be known, and also that the air never presses more than fifteen pounds to the square inch. The next quality of the air is elasticity. Press it so as to make it occupy a smaller space than it otherwise would, and then take away the weight, and it comes back and occupies its original space. The lecturer then explained that in the air there were two gases; one oxygen, which is that part of the atmosphere by which chiefly we live, and which is the one-fifth part; and the other nitrogen, which is four-fifths of the atmosphere. Oxygen supports life and combustion, and nitrogen restrains its effects and dulls its operation. The quantity of air which a person consumes depends in a measure on oneself, and by training can be made more or less. The tailor and shoemaker take little in comparison with the laborer, and the public speaker and singer, or those who cry commodities for sale through the streets. A man in good health makes eighteen respirations in a minute, and in twenty-four hours consumes fifty-one hogsheads of the air. As the oxygen which supports life is so small we ought to be very particular how we permit other gases to mix with it and vitiate it. The blood when it enters the lungs, is black, but when the oxygen acts on it it becomes red, and sends it through the veins to impart life and animation. This black blood is produced by carbon and imparts the blackness which we see in the face of persons who lose their lives by suffocation, because the oxygen was not allowed to reach the lungs to purify it. When we send out the air from the lungs we do not send it in the same manner as we inhaled it, for when exhaled it is as deadly a poison as arsenic or corrosive sublimate. The lecturer showed this by experiments, and filled a vase with his own breath, in which a lighted candle would not live. It was such air as killed persons who went down into wells in the country, or who died when a pan of charcoal was placed in a room. The danger of taking impure matter into the stomach was not so great as into the lungs, for the stomach had power to eject impurities which the lungs had not. Beside the impure air which we exhale there are 2,800 pores on every square inch of the surface of the body, and to a body of large size there are 2,590 square inches; and these multiplied make 7,000,000 of pores. There is a sort of drainage pipe in the body, which sends out matter as well as gas, and this pipe is calculated at twenty-eight miles long. The particles of matter which are sent out, and which do not dissolve are so numerous, that in China, where the houses are low and a great many persons are in the habit of assembling in one room, it has been discovered that, after fifteen or twenty years, these particles adhere to the ceiling of the rooms that the farmers will contract to put up a new ceiling if they are allowed to take down the old one, so valuable has it been found for manure.

Parker's Water-Wheel Patents

Some of our readers having misunderstood some of our articles concerning the patents on Parker's Water-Wheel, which were published in our last volume, we would state that the original patent was issued Oct. 19th, 1829, and was extended seven years from its original date, it therefore expired in 1850, and is now public property. The claims of this patent are as follows:—

"1st. The compound vertical percussion and re-action wheel for saw mills and other purposes, with two, four, six, or more wheels on one horizontal shaft. The concentric cylinders enclosing the shaft, with the manner of supporting them. The spouts which conduct the water into the wheels, from the penstock, with their spiral terminations between the cylinders. 2nd. The improvement in the re-action wheel by making the buckets as thin at both ends as they can safely be made, and the rim no wider than sufficient to cover them. The inner concentric cylinder; the spout that directs the water into the wheel; and the spiral termination of the spout between the cylinders. 3rd. The rim and blocks, or planks, that form the apertures into the wheel, and the manner of forming the apertures. The conical covering on the blocks, with the cylinder or box, in which the shaft runs; and the hollow or box gate, in any form, either cylindrical, square, rectangular, or irregular."

Another patent was issued to Messrs. Parker for improvements in Water-wheels June, 27th, 1840, which will expire June 27th, 1854. The claim is—"the placing of the said wheel or wheels, or of wheels analogous thereto, in their construction and mode of operation within air and water-tight cases or box, denominated drafts, substantially in the manner and for the purpose set forth."

Our readers will now understand the exact scope of the two patents, without the necessity of relying upon the statements of others.

Fire Telegraph in Boston.

We have received a letter from Boston, stating that the article in the Scientific American, taken from a Lowell paper, about the failure of the "Fire Telegraph," is not correct The article, "probably originated," says the letter, "from a report to the City Government, that the *Alarm* was inefficient—that is, there was not enough of it. The City has, therefore, added three more bells, and also more alarm boxes. There is no failure about the Boston Fire Telegraph, and the City would be loth to go back to the old system, for, under the present, alarms of fire have decreased about 40 per cent. There have been but few irregularities, which may be well allowed for the newness of the system." Thus, as quoted, writes our correspondent.

A splendid mass of pure gold weighing 28 lbs. 4 oz. has been lately found at the Australian diggings. This superb mass has been purchased by the executive of the colony for $8,250, and has been transmitted per steamer to England as a present to Queen Victoria.

Philadelphia last year consumed 3,253,177,762 ale gallons of water, and 1,415,188,000 feet of gas. The daily average consumption of water in the city proper and the districts of Southwark and Moyamensing was 6,731,744 gallons.

Machinery and Tools as they are.--Printing Presses.

(Continued from page 139.)

HAND PRESSES—The mighty printing machine counts its hourly productions by thousands, the humble hand-press produces at the utmost but a few hundred impressions in the same time; such being its vast inferiority, its total disuse would appear inevitable, and yet, contrary to this inference, the hand-press maintains its position, chiefly owing to its simplicity and consequent cheapness. As any kind of pressure is sufficient to obtain an impression on paper. a printing press might be an exceedingly simple machine, but it is made complex in order that the printing may be done well and rapidly. The first hand-presses were merely common screw-presses made of wood, and such, with slight improvements, they remained until within the last half century, when iron superseded wood in this machine, as it has in most others; nor was this the greatest change, for the screw was first improved by the addition of well-arranged bars, then totally abandoned, as not permitting sufficient rapidity, and its place supplied by compound levers. But without tracing its successive developements, let us content ourselves with examining the hand-press as it is now generally made. The frame is composed of a heavy mass of cast-iron, and consists of a stout head piece connected to an under piece nearly similar, by two strong columns. It will be easily understood that the whole of the pressure exerted has to be endured by these two cross-pieces of the frame, whence the necessity for their being made massive. On the under piece are placed the ribs, which form, as it were, a railroad, on which moves the bed destined to bear the type. Over the bed is suspended the platen which is intended, by being forced down, to press the paper against the type. This is effected by levers, having a fulcrum on the under side of the head piece, and bearing on the centre of the platen; the power of the pressman is further increased by the bar-handle, which is also a lever acting on those we have just mentioned, so that the whole arrangement forms a compound lever of great power, and which furnishes an exemplification of the law of virtual velocities. For the pressman grasping the bar-handle near its extremity, his hands describe an arc of a circle, whose diameter is considerable, whilst by this action the platen is made to descend through only a small space, but capable of overcoming a great resistance. When the impression is imparted, the next thing to be done is to raise the platen from the form, which is performed without occasioning any trouble to the pressman, for he simply relaxes the intensity of his grasp, when the platen is pulled up by spiral springs with considerable energy. The next duty of the pressman is to turn a crank, by which the bed (on which are lying the form and paper) is moved from under the platen, so that he can raise the blanket, the tympan frame, and the frisket. All which form the apparatus for securing the paper and preventing any injury to it from the type. Whilst he is occupied in detaching the printed sheet, and then fixing another to the tympan frame, the type receives a fresh supply of ink from a roller, impelled by means to which we will hereafter advert. The tympan frame is now folded down on the form and the bed made to resume its place under the platen, when the work of printing is resumed, all these several operations being performed 250 or 300 times per hour. In some hand-presses the bed is not movable but remains stationary, whilst the tympan frame alone is run out, and during its absence from its position on the bed, an inking roller is made to move over the form, which retires in time to allow the tympan frame to resume its original situation. For convenience, the press is placed upon standards to raise it to a sufficient height, so that the bar-handle which moves in a horizontal plane can be worked by the pressman, without the necessity of inclining the body. Such is a description of the machine more especially known as the hand-press, but a variety of presses that may be worked either by the hand or foot, are likewise manufactured. Probably the most ingenious of these latter are the card presses, now so much, used by printers, they are intended for expedition, and as the form contains but a few pieces of type, a small bed and platen of about the size of the cards to be printed are placed vertically opposite to each other. The platen is stationary, and two small guides that are fixed to the upper part conduct the cards to their place on the platen, where they are held by a light spring. On the bed is fixed the form, and when the type is inked the bed is forced against the platen by a cam, it then runs back, when the card is released and drops into a box, whilst the printer who keeps the press at work by a treadle, can supply another card to the platen.

Not the least ingenious part of the mechanism is the inking apparatus which is self-acting, a fountain with the usual arrangement of rollers being placed above the bed and platen, when the bed has retired some distance from the latter, it stops, and an inking roller runs down, pressing against the type in its progress, and as quickly re-ascends. Nor is this the only form of the card press, many excellent machines of different shapes have been invented, some of the best kinds of which will be found described in the preceding volumes of the Scientific American. For example, in one kind the platen moves on a pivot, and is forced down by a roller on a vibrating angular piece, which latter also supplies an inking board; (see Sci. Am., Vol. 7, p. 316). In another (Gordon's Card Press) the form is attached to a revolving cylinder, and the paper or card-board, in an endless web fed down to a flat bed, and as the cards are printed they are cut off.

The supply of ink to the type is an important subject of consideration to the printer his predecessors used inking cushions or balls formed of sheep-skin, and stuffed with wool; yet later, a boy provided with a roller composed of a mixture of molasses and glue, supplied the form with ink after each impression, but it is now very common to have for this purpose a separate machine, termed an inker. There are various sorts of this apparatus, some of which are more simple but less convenient than others, but almost all employ a fountain or reservoir. In this fountain a roller is made to revolve, and as the ink, from its unctuous nature, is likely to collect in masses on the roller, a steel straight-edge is made to bear against it, and thus act as a scraper. Another roller that, in addition to its rotary movement, also vibrates lengthwise, receives the ink from the above, and finally, after these or further additional transfers, the ink is yielded to composition rollers, which are placed on carriages so as to be propelled over the form. It is in the mode of effecting this latter process that the inkers mostly differ, perhaps that which is worked by steam power is the neatest. In this case it is placed by the side of the press, so that the roller carriage easily runs on to the press bed. To operate it, the pressman, after raising the tympan, merely touches a handle, when the cog wheels which impel the carriage are thrown into gear, and, by a crank motion, turn a spindle, to which is attached one extremity of a long elbow joint. The other extremity is attached to the roller carriage, which, consequently, moves forward along the press bed, and afterwards returns, during which time the inking rollers bear against the type, the whole operation resembling the actions of a man who might hold a cylindrical body between his fingers and roll it back and forwards on a table. When the carriage has returned, the wheels are thrown out of gear, and then, although the distributing and other rollers are revolving and supplying the ink, the carriage is unable to move forward until the pressman desires.

On the use of gutta percha and papier mache stereotype cylinders, we will here make no comments, but wait until something practical has resulted; there is, however, a species of printing which has made advances equal to those already mentioned, and to which its processes are often very similar,—we allude to calico printing—all the cheaper cottons being now printed by a cylinder press. The pattern is engraved on the surface of a copper cylinder, which, by mechanism, is made to feed itself with color, take off what is superfluous, draw in the material to be printed, and then perform the printing. In this process several cylinders are employed (every color requiring a separate one), which are ranged around a large drum, each copper cylinder being supplied with its own trough of coloring matter and attendant rollers. To effect the printing, the cotton is passed between the large drum and the printing cylinders, which, in some recent presses of this description, amount in number to eight; an improved Calico press has been lately introduced by which each copper cylinder can be made to print in three or four colors by a novel arrangement;—this is the mode of printing ordinary articles, but those of a costlier kind are still printed by the block method.

For the Scientific American

Sulphur and the Cholera.

As it is highly probable that cholera will be prevalent this year, I deem it right to make a communication to you, for publication, of the very important fact that "sulphur infused through the system is a certain preventive of cholera. The best mode of administering the sulphur, and one which all classes and ages can employ, is thus:—For an adult put half a teaspoonful of washed flour of sulphur in each stocking every morning, so that the sulphur shall come in contact with the soles of the feet: the body has so great an affinity for sulphur, that it will be absorbed by the feet and become infused through the body, and effectually prevent an attack of cholera.

The above mode of administering the sulphur is the best, because it is susceptible of universal employment. Drinking sulphur-water and the inhalation of air slightly charged with sulphurous vapor is another preventive mode of administering the sulphur, which renders sulphur springs safe places of resort in the cholera season.

I annex an account of the mitigation of the cholera after the occurrence of an earthquake, and there is no doubt in my mind that it is due to the sulphurous vapor that escapes from the earth at such a time.

A St. Jago paper, speaking of the recent earthquake at that place, says it has effected prodigies, the number of deaths from cholera having diminished very materially, and the people generally believed that the earthquake had effectually killed the malady. Persons suffering under violent attacks arose from their beds, and after being for hours in the streets, in the damp morning air, felt no return of their sickness.

Firing cannon, or burning gunpowder, to a limited extent, would have a similar effect from the sulphurous vapor involved. This information as to the utility of sulphur in the prevention of cholera, is obtained by observation and conversation with eminent medical and scientific gentlemen, and from all that I can gather on the subject, it appears to be a fair conclusion that—the existence of cholera is due to an absence of a proper proportion of pure oxygen in the atmosphere, and hence the purification of the blood and generation of heat in the body is diminished; and as the body possesses a strong affinity for sulphur, and sulphur possesses a strong affinity for oxygen, the use of sulphur attracts and restores the oxygen to the body, and the proper generation of carbonic acid, which, together with the laxative and diaphoretic action of the sulphur, purify the blood, keep up the heat of the body, and prevent cholera.

A more active remedy than sulphur is required to cure the cholera, but the use of sulphur as I have stated, will prevent an attack of the cholera, and therefore I send you this communication under the truth of the maxim, old yet substantial, that an ounce of prevention is worth a pound of cure. Yours, &c.,

W. W. H.

Philadelphia, Jan. 12th, 1853.

Form and Heat of the Earth--North West Passage.

MESSRS. EDITORS.—I have lately noticed an article going the round of the papers, relative to a new theory, which I think is open to objections. It is that which contends for the existence of an open polar sea, and a warmer climate in those regions than we have heretofore been taught to imagine. The advocates of this hypothesis give a coloring to their conclusions by citing certain phenomena which have been observed in high northern latitudes, such as the flight of large flocks of birds to the north, currents setting northward, and so on, but they chiefly rely upon the theory of the igneous origin of our planet to prove their point. For instance, they say since the earth's diameter from pole to pole is shorter than its equatorial diameter, the distance of the surface at the poles from the centre being less, a proportional increase of temperature must follow, for if we descend below the surface at any point, even for a moderate distance, a considerable change is felt. Some, I believe, have gone so far as to suppose a concavity at its poles, giving the earth somewhat the shape of an apple, whence, according to their reasoning, an almost tropical climate would be found if we could only pass the intermediate barrier of ice, and arrive there.

Now, if we admit the only theory from which these hypotheses can receive the slightest support (and it is one which has received the sanction of some of the greatest scientific men of our own time.) I think it can be shown that they are entirely fallacious. The main point of this theory is, that our planet was originally a molten, liquid mass, and that by the radiation of its surface heat into space, the present crust was formed. Now, we can see no reason why the present crust should be thinner at the poles than at the equator. On the contrary it would be thicker, since, at the equator, the vertical sun's rays would always help towards maintaining the original heat, while at the poles the cooling down process could go on with little or nothing to counteract it. Hence we have two reasons why the cold should be very intense at the poles:—first, the absence of the sun's rays, and second, the greater distance of the surface from the intense heat. As for the concavity at the poles, no reason can be assigned why it should exist there any more than at any other points on the surface. A liquid, revolving mass will always assume the form of an oblate spheroid, unless, indeed, the centritugal force is great enough to cause it to take the form of a ring, and even then, nothing but a remarkable uniformity of density will prevent its separating into parts. The figure of the earth has been determined with great exactness by mathematicians, and the amount by which it varies from an exact sphere is such as we would be led to infer from its known density, size, and rate of revolution. Yours, &c.,

H. H. BATES.

Geneva, Jan. 8, 1853.

[Our correspondent effectually disposes of the igneous theory affecting the fluidity of the seas at the poles; this theory, as advanced for an open polar sea, we have considered of no value; but the facts of currents, flocks of birds, and passages of northern whales, from the Atlantic to the Pacific Ocean by the Northern Seas, are evidences of an open sea at the north not to be overlooked. It is our opinion however, that there is no fixed open arctic sea.

High Price of Ships.

The "Saco Union" records the following recent sales:—

"We learn that Messrs. Bourne & Kingsbury, of Kennebunk, have sold their beautiful 'Northern Crown' for something above $82,-000, which is $2,200 more than their price two weeks since. The ship Charles Humberston, mostly owned in Kennebunk, was sold last week in Boston, for $33,000; she is about 14 months old, has never been coppered, and after having made the owners two good voyages, has been sold for about $11,000 more than the original cost.

A Grand Junction Railway in Paris.

A league and a half of railway which is to girdle Paris, was opened on the 12th of December. The road was undertaken by five of the great companies, who subscribed each a million of francs, leaving the government to execute the whole, of which the cost is estimated at nine millions altogether. It will connect all the stations round the capital, and reduces the expense of transit of goods and travellers to a tenth of the present amount.

The first locomotive on the railroad from Bombay to Tanna took place on the 18th November, to the great astonishment of the natives. The road will not be formally opened till February.

NEW INVENTIONS.

Improvement in Butter Firkins.

Butter firkins, as at present constructed, require to be sawn horizontally through the centre, or the head removed, in order to obtain the butter, which is liable to be injured from the consequent exposure to the air. As an improvement on the above, a new method has been invented by Daniel Minthorn, of Watertown, N. Y., who has taken measures to secure a patent. The firkin is made to consist of two parts, which are connected together by means of a taper flange on the core of the one, which fits into a corresponding recess cut inside the edge of the other, the two parts being kept firmly together with hooks or any other suitable fastening. The great advantage of a firkin of this description is, that small quantities of butter can be taken out when required, and the firkin afterwards closed air-tight, which renders it superior to those of the ordinary construction for family use; moreover, the firkin can be used repeatedly for the same purpose until completely worn out.

Improved Railroad Switch.

An improved self-acting switch has been invented by James M. Dick, of Buffalo, N. Y., who has taken measures to secure a patent. It consists, in addition to the usual arrangement of two levers projecting upwards a short distance above the rails, which are made to act upon springs, when the car wheels pass over them. The movable rails are, in consequence, drawn or pushed back into the required position, either for communicating with the branch or the direct line, according as may be desired. In case they are in line with either of the branch tracks, and a train is passing along on the direct road in either direction, the movable rails will be brought in line with the rails of the latter, as soon as the wheels depress either of the above-mentioned levers.

Improved Grain Separator.

Francis King, of Ithaca, N. Y., has taken measures to secure a patent for an improved Grain Separator. In this improvement the grain, before passing into the riddle, is made to fall through an open concave receptacle, composed of thin strips of metal or other material, so as to allow of its more perfect separation before its escape into the former. In the central part of this concave receptacle the separator is made to revolve, and the slots and endless belts are so connected together that there may be no liability of their becoming disconnected when the mechanism is in operation.

Tonguing and Grooving Machine.

Measures to secure a patent for improvements in the above have been taken by John B. Tarr, of Albany, N. Y. The nature of the improvement consists in the use of a set of cutters, called by the inventor side finishers, which are arranged in any proper manner to suitable stocks in conjunction with the groove and tongue cutters. It being intended by means of the above, to plane the sides of the grooves and tongues, as they are shaped. The advantages of this improvement are, that, by its employment, a better joint may be formed than can be done by the machine now generally used.

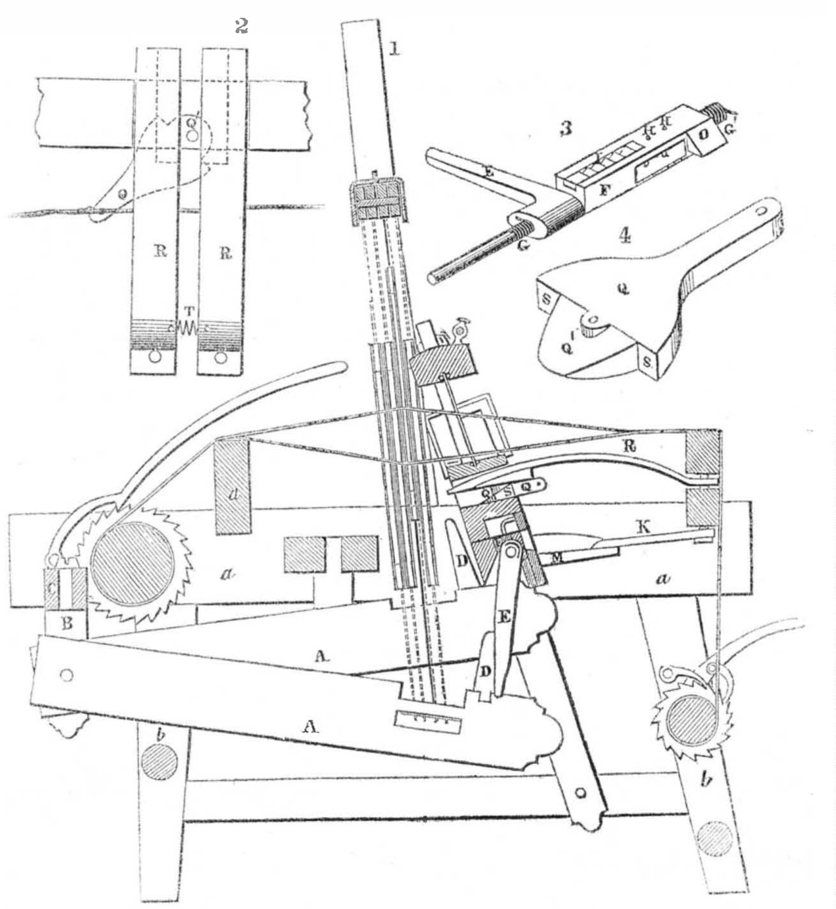
Boring and Mortising Machine.

Measures to secure a patent for improvements in the above have been taken by N. C. Travis, of Canistota, N. Y. The merits of this invention consist in attaching to the same driving shaft both a crank pulley for communicating the reciprocating motion, and also a band wheel to give a rotary motion. Both the pulley and wheel revolve loosely until either operation of mortising or boring is required, when, if the former is wanted, the pulley is thrown into gear by means of a clutch, but if the wood is to be bored, the band wheel is operated by a similar arrangement. Either of these adjustments can be effected whilst the driving shaft is in motion by simply shifting a lever. In cases where hard wood is to be mortised, this plan is peculiarly valuable, as it is necessary to employ, previously, the boring operator, it the chisel is to cut effectually.

Cutting Barrel Heads.

A machine of the above description has been lately invented by Franklin Fruit, of Jefferson City, Mo., who has taken measures to secure a patent. Barrel heads are formed of several pieces, and these often vary in thickness, hence causing some difficulties in the process of chucking. The inventor has overcome this obstacle by using a chuck of a peculiar description. It is made of two circular discs with a series of centres placed in a circular form. Each centre is provided with a spiral spring, so that it can yield to accommodate the different thickness of the wood. All persons engaged in this great branch of manufacture will understand that the chuck can be employed in conjunction with the usual shaping and bevelling apparatus.

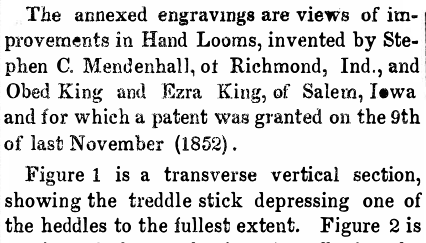
IMPROVEMENT IN HAND LOOMS.



The annexed engravings are views of improvements in Hand Looms, invented by Stephen C. Mendenhall, of Richmond, Ind., and Obed King and Ezra King, of Salem, Iowa and for which a patent was granted on the 9th of last November (1852).

Figure 1 is a transverse vertical section, showing the treddle stick depressing one of the heddles to the fullest extent. Figure 2 is a view of the mechanism for effecting the throwing of the shuttle. Fig. 3 is a detached view of the finger shaft and finger, with the springs for recoiling the same. Fig. 4 is a detached view of the picker-staff, showing the double inclined planes upon its end. Figure 5 is a view of the mechanism for effecting a movement of the heddles, detached from the lay and breast beam. Similar letters refer to like parts.

FIG. 2.



The improvements consist, first, in effecting a movement of any number of heddles, and varying the number of the same by a motion derived from the lay, so as to produce fabrics of two or more leaves with the same loom, without the use of cams and without removing any part of the machinery. Second, in effecting a throwing of the shuttle by an inclined plane action, which operates independently of that for shedding the web.

a are the beams; *b* the stanchions connected together by the breast beam and other cross ties, which are constructed of such form and size as are suitable to support and sustain the moving portions of the machinery. A are the treddles (which can be varied to any desired number, as we can operate two or more of them at pleasure, and can produce with the same loom fabrics of any number of leaves), swung from behind, instead of from the breast beam, as usual in hand looms, from the arms, B, projecting down from the treddle tie, C. D are arms secured to the tops of the treddles, which serve as guides and butments of the finger, E, to act against.

The mechanism to operate any number of heddles, and vary the number of the same at pleasure, with the same loom, without the use of cams and without removing any part of the machinery, consists, and may be described as follows:—F is the finger shaft, which is constructed square at one end for part of its length, the remaining part being a round shaft, cut through its square end is a mortise through which pass and are secured a series of pins, H, which correspond in number to the treddles, and serve as butments for the nerves, K, to act against. On the top side of said square end are provided a series af notches, I, which are the same distance apart as the pins, H, but are less in number than the treddles, and suitably suspended on a fulcrum in the beam of the lay is a pawl, J, which falls into said notches, so as to prevent the shaft, F, from moving in one direction, while it is kept from moving in the opposite direction by a spring, G'. Attached to the square end of said shaft is an inclined plane, O. E is the treddle stick or finger which moves freely on the round part of said shaft, but is kept close against the shoulder by a spring, G, which spring also answers the purpose of causing said finger to act gradually upon the butments, D, and assume a position, again, when the lay is on its backward movement to operate against the butment in the same manner when the lay is again on its forward movement. Cut through the beam of the lay is a mortise into which is secured the guide boards, M M', and it is provided with an inclined plane, N; the guide-boards are for the purpose of guiding the nerve, K, into the mortise of the finger shaft, and the inclined plane, N, by its action upon the end of said nerve causes a movement of the finger and shaft at each backward movement of the lay in the following manner:—On the back ward movement of the lay, the nerve, K which is hinged to the under side of the breast beam, and provided with a spring, L, which keeps it close against the side of the board, M', is guided by said boards so as to enter the mortise in said finger shaft, and by acting against the inclined plane, or by the action of the inclined plane upon its end, causes it to force the finger shaft to slide the distance of one of the notches, I, or in position to operate upon the next treddle, thus at each backward movement of the lay, the shaft, F, is moved one notch by the action of the nerve, as described, in which position it is retained by the pawl, J, until the finger has operated a treddle, and the nerve adjusts it again, ready to operate the next treddle. After the number of treddles, to produce the number of sheds required, have been successively operated in this manner, the inclined plane, O, causes the nerve, K, to slide up over it, and under the pawl, J, which releases said shaft, F, and allows it to recoil to the starting point, ready to repeat the same sheds. With this arrangement for effecting a movement of the heddles, it will be seen that to vary the number of heddles to produce any number of sheds of the web, it is only necessary to prescribe the limit to which the finger shaft shall slide or recoil in the lay, and that said shaft can be adjusted so as to operate two or any number of treddles, by simply inserting a pin through holes provided on the lay beam at suitable distances apart for that purpose, as represented in fig. 5, or a bit of wood placed in the mortise in which the shaft slides, so as to check it, will answer the same purpose.

In the action of the treddle stick or finger on the treddles, there is this feature of difference between this arrangement and all other hand looms: the treddles are swung from behind instead of from the front, so that the finger acts upon them at or nearly a right angle, and the leverage can be increased to any extent, whereas, on other looms, where the treddles are swung from the breast beam, the finger acts at a greater angle, and consequently diminishes its power, to effect a movement of the heddles.

The simple device for effecting the throwing of the shuttle backward and forth, when the web is shed by mechanism independent of that for shedding the web, operates upon ~~the principle of the inclined plane~~. The picker staff is provided with inclined planes near its fulcrum, which are so arranged with and operated upon by hooks on the breast beam as to produce a very regular and perfect back and forth motion to the shuttle, said hooks being self-acting. Q is the picker-staff, formed with inclined planes, Q', on each side of its fulcrum. This peculiar construction of the picker-staff, in combination with the hooks, R' R, and spring, T, have the effect to raise said hooks alternately clear of the shoulders, S S, on said picker-staff, producing a catching or impinging of said hooks against the shoulders of said picker-staff, on the forward movement of the lay; said hooks are hinged to the breast beam, and have a spring, T, between them, so that they shall have both lateral and vertical play; when the picker-staff is in the position represented, one hook is acting against one of its shoulders, S, while the other hook, which is held close against the round part of said picker-staff, by the action of the spring, T, is forced to slide up the inclined plana, Q', thus clearing the hooks of the shoulders of said picker-staff, alternately, and effecting a sure throwing of the shuttle.

More information may be obtained by letter addressed to Mr. Mendenhall.

Improvement in Clock Escapement.

David Walker, of Newark, N. J., has taken measures to secure a patent for an improvement in the above. The merit of this improvement lies in the use of springs to regulate the motion of the pallets, and to cause them to catch into the teeth of the "scape wheel." The elasticity of the springs permits them to yield to the pressure of the pallets in case of any departure from the regular movement caused by the catching of the pallets upon the extreme edges of the teeth of the "scape wheel," or by any similar occurrence that tends to raise the pallets more than usual. The advantage gained by this plan is obvious, for the "scape wheel" will be able to continue its motion, and after the obstruction has passed the springs will act upon the pallets as usual.

A new steam ferry boat is to supersede the Troy horse boat.

Scientific American

NEW-YORK, JANUARY 22, 1853.

The Hot Air Ship Ericsson.

On Tuesday last week, this ship made her second trial trip down the Bay, and we suppose the whole country has heard of it by this time, as many of the daily papers in our city were filled next day with fulsome accounts of its *success*. The reporter's account of it in the "New York Daily Times" says "*it made ten knots an hour with ease*," and again, in another place, "it accomplished a distance of nearly twenty miles in two hours and a half," thus contradicting itself at the rate of two knots per hour. The ship in smooth water—with the tide against and with her—made an average speed of eight knots per hour. The daily papers said, "by the courtesy of those interested, the trial trip was confided mainly to the consideration of the Press of this city, and a few gentlemen whose scientific abilities render them amply qualified to pass judgment upon a subject fraught with such momentous results."

This is not true. With perhaps one or two exceptions, not one of the Press of New York invited, were competent to express a solid opinion upon the real merits or demerits of the Hot Air Marine Engine. That part of the press devoted to such subjects, some of which have been long acquainted with engineering, historically and practically, were not invited. The scientific gentlemen spoken of, with but one exception, were not qualified judges;—none of our eminent engineers were there. As we managed to be at the *select* fire annihilator experiment, we were there—AN UNINVITED GUEST. Capt. Ericsson having learned that we were aboard, on the trip, called upon us next day, and said, when all his machinery, valves, &c., were tight, and in perfect order, which he had not time yet to render so, it was his intention to invite us along with the engineering fraternity, to inspect and go on a trial trip. This explanation is perfectly satisfactory, although we cannot but think that the good opinion of one eminent practical engineer in favor of the hot air engine would be worth more than all the very extravagant language of Mr. Dana, of the "Tribune," and all the rest of the daily paper fraternity besides. No men are so willing to make allowances for extra friction and leaks in new machinery as engineers, and when it is taken into consideration that the opinion of the daily press was first solicited, not by word but deed, experienced men will take this very fact as an evidence of doubt in respect to the success of the ship.—Another thing is, the daily papers, in general, make so many incorrect statements about any new enterprise, that in our opinion, they do more harm than good to Capt. Ericsson. He is far more modest of what he has done than they are. Thus, for example, the New York Daily Times says, "it is the introduction of *a new motive power*." Now, when a merchant reads this, and goes to an experienced engineer and says, "sir, is hot air a new motive power, was it ever employed before, do you know anything about its nature and principles?" and is answered, "yes, I know of it historically, it is as old a power as the steam engine," and then shows him printed authority for its being in use thirty years ago, and also explains its nature and principles; said merchant, if he had any prejudice against the hot air ship before, would now have it confirmed instead of weakened, owing to the ignorance of the daily papers. Incorrect assertions, and indiscreet language do more injury when used in favor of a new scheme, than downwright opposition to it. Captain Ericsson does not claim to be the discoverer of "a new motive power;" he claims to be the inventor of an improved application of it; "an application and combination of machinery which has rendered it successful, and made it more safe and economical than steam." These are his claims in general terms. In 1832 he took out his first patent for a hot air engine in London, and in 1851 he took out a patent in the United States for an improvement—his engine as it is now constructed. At the present time it is not necessary for us to explain its principles; we published an engraving of it on page 60, of our last volume, taken from the patent specification, but which was not correct in one particular, it said, "after the engine is in operation the circulating medium is heated independent of combustion." This is not so, a portion of the heat, 30°, is lost every stroke; this has to be maintained by combustion; it is not therefore pretended to be a perpetual motion. The principle of the hot air as applied, is there correctly illustrated, and by reference to it our readers will get a far better idea of its operation than in any other published description of it.

During the trip, Capt. Ericsson, by a working pasteboard model, explained the principle and construction of his engines in a very persuasive manner. They are entirely different in arrangement and dimensions from steam engines. In the engine room, instead of two close cylinders as in the steam engine, there are four large under cylinders of 22,300 square inches piston area each. These have no cylinder covers, they are only single acting, and two of them, if placed end to end, would be like the common double acting single steam cylinder. Over these lower cylinders are placed four other cylinders of 14,794 square inches piston area each. These are worked by rods attached to the pistons of the lower cylinders. These upper cylinders are huge air feed pumps, one for each working cylinder. There are no boilers; there is a chamber under each piston of the working cylinders into which the air is forced by the upper feed pumps, and is there heated, by spherical furnaces below; the expansion of the air to increase the volume and work the lower pistons is caused by the caloric or heat imparted from the furnaces. Before the engines could be started, air was forced into reservoirs above by a force pump driven by a steam engine, we believe, but which we did not see. When the air is compressed to 12 lbs. on the square inch, there is no further use of extraneous power. The heat applied in the furnace expands the air under the lower piston; it is forced up, and in so doing the upper piston forces a quantity of air into a reservoir, then when the stroke is completed, the hot air valve is opened, the air rushes out into what is termed a regenerator, and escapes into the atmosphere. This regenerator is an escape pipe or chamber, in which is placed a pile of wire gauze. This pile of minute tubes absorbs the caloric from the hot air, and when the exhaust is complete, the cold air to feed the lower cylinder is then forced through this hot wire gauze, taking up the heat as it passes through. It is this principle of saving the heat which is asserted to be the grand new discovery and improvement. This principle of saving heat is not new, but the plan of applying it is, and belongs to Capt. Ericsson. What the resistance or power expended in the regenerator is, we cannot tell. In the high-pressure engine, the exhaust steam passes at once to the air, and the cold water is fed at once to the boiler. But in those steam engines which exhaust into the water tank, and the locomotive stack represented in last week's Scientific American, we have the same principle of saving heat applied, although it cannot thus be carried out as far as in that of the hot air engine. Victor Beaumont, a gentleman who was on the trip, in an article in the "Herald," compares the action of the hot air engine, for saving the heat, to a person having a piece of sponge in his mouth; it retains the heat given out in the act of expiration, which heat is taken up by the air passing into the lungs during the act of inspiration. This is a just and very beautiful comparison, but he forgot to add, that this act increases the labor of the lungs so much, that we find it more easy in the machine of machines—the human body—to eat a little more food—expend a little more heat than to keep the sponge in the mouth to save heat by respiring through it.

Capt. Ericsson stated that only six tons of coal were used in his four single acting cylinders in twenty-four hours. This is, indeed, a very small quantity The Baltic and Pacific use 58 tons in the same time. We know that double speed involves four times the amount of fuel, but even this makes some difference in favor of the hot air engine. A correspondent of the "Brooklyn Eagle" makes out the power of the caloric engines to be only 228 horse-power, while a favorable writer in the "New York Herald" makes them to be 600 horse-power. We have nosatisfactory data to make a correct calculation. We make it to be 437 horse-power, for we take the force of heat to be 15 lbs. per square inch for every 491°, not 480° as set forth by Dalton and others. We do not give this as a correct estimate, but from data furnished, we make the united power of the engines no more, after allowing 250 horse-power for friction and other losses, this being 229 horse-power less than the favorable writer in the "Herald." One thing strikes every engineer at once, that is, the immense power expended in working the feed pumps. Out of 22,300 square inches of each piston area, no less than 14,794 inches of its pressure are expended in working each feed pump, thus leaving only 7,506 square inches of effective working surface. In marine steam engines a feed pump (single acting) for a double acting cylinder, is only 240th the capacity of the cylinder, while the feed pump of the caloric cylinder (single acting) is about two-thirds the capacity of the working cylinder. The air-pump of a marine engine is only one-eighth the capacity of the cylinder, therefore the power expended in the caloric engine upon its own self, in comparison with the steam engine is enormous. The saving said to be made is in economizing the heat, as before stated.

A very excellent dinner was given on board, and then wine and a lunch was served up. A committee was appointed to draught resolutions, expressive of the opinions of those on board. This conduct, so far as the resolutions are concerned, we do not like. It has a tendency to prostitute the independence of the press. The names of those present are solicited to sign the resolutions adopted, and after a man has eaten his host's salt, he feels a delicacy in refusing his signature to resolutions respecting him, although he does not in conscience believe in their truthfulness We could have signed all the resolutions adopted except the second and fourth. We do not believe it will supersede steam, or that it is in every respect superior to it, as stated in those resolutions. If it is superior to steam in *every respect*, it has not been so demonstrated to our satisfaction, and we cannot be convinced to the contrary against our will and reason. We know that some men look upon others as *opposed* to them when they differ in opinion respecting the feasibility and superiority of a new invention. This is evidence of a weak or unreflective mind. Opposition to a scheme does not consist in a difference of opinion as to its success and usefulness, but consists in efforts against its success. We never can have the least earthly interest in opposing any new invention, but when we cannot see into its usefulness, we must say so, or be recreant to our duty as journalists. We heartily wish success to Capt. Ericsson and his compatriots, for patriots they certainly are; the caloric ship Ericsson, is a miracle of faith and enterprise, their energy and spirit deserve success and the praise of the whole world. Neither our opposite opinions as to its ultimate success as a substitute for steam, nor the adulation of all our daily papers can make it successful or unsuccessful. If it has the real *vis insita* in it, successful it must be; if it has the *vis inertiæ* in it, fail it must. Its proprietors, it is said, are satisfied with what it has done; very well, they need not care for our opinion, or the opinion of any disinterested men, about its success or failure. After it has made a few voyages across the Atlantic, we will have some data upon which to form a correct judgment—for as yet it has not done so well as Robert Fulton's first boat, which, with its clumsy shape and bad machinery made seven miles per hour. The caloric ship has new and very excellent features about it. The designer and constructors of its machinery have shown themselves to have long heads, and skilful hands. We have never seen anything to compare with the castings. It is safe and comfortable we believe for passengers, and it saves the firemen from the pandemonium of our steamships. The caloric engine, as a saver of fuel is chiefly valuable for steamships, but if it merely saves fuel while it is sluggish in its motion, we could do that without using any fuel at all. Speed and economy of fuel must go hand in hand to command success; if these two elements cannot be combined, the latter, in this age of lightning speed, must be sacrificed to the former.

At the meeting on board the Ericsson, Prof. Mapes being called upon to make a few remarks said, "I consider there were but two epochs of science, the one marked by Newton, the other by Ericsson." The inventor to whom this unwholesome flattery was paid, rebuked the author of it with manly modesty. Some of the select representatives of the press made frothy speeches. Mr. Dana, of the "Tribune," next day used the following language: "the age of steam is closed, the age of caloric opens. Fulton and Watt belong to the past, Ericsson is the great mechanical genius of the present and future." Compared to this, the most *immoderate* flight that ever poet took when warm with wine, is *moderate*." Capt. Ericsson is a very scientific, skilful, and ingenious engineer, but he employs everything that Robert Fulton invented, and is more modest in lauding the merits of his invention, than the few un-scientific croakers who blunderingly call the invention a new motive power. As for the great Watt, he belongs to the *past*, and still rules the present, the future is still the untried; "let not him that putteth on his armor boast." A correspondent of the "Philadelphia Ledger" says, "we (Scientific American) have denounced the caloric engine as a deception." We have not; no person can point to a single sentence of denunciation, uttered by us, and as for the word "deception," we never used it. We wish the caloric ship success, and in respect to it we know what it is to feel—to wish—that our reasoning may be at fault, and our judgment swayed by our old associations and experience with steam. As it regards the saving of fuel, we will have something more to say next week.

Colt's Revolver.

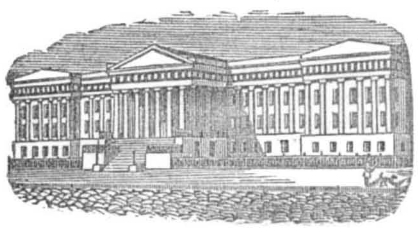
We have received "The United Service Gazette," London, containing an account of the performance of Colt's revolving pistols at the Cape of Good Hope Colony. They have gained a reputation there exceeding that which they have hitherto obtained among ourselves, the native land of the inventor. Col. Colt sent out Mr. Peard as his agent to Cape Town, with a quantity of his revolvers and he invited the most celebrated shots in the British army there, to test their rifles with Colt's revolvers, at distances from 200 to 600 yards. The result of a fair trial at 200 yards distance, was, that the Rifle Corps of the army was beaten by the revolving pistol. The fame of this weapon has spread over all Southern Africa, and the recent news of the termination of the Caffre war may be in some measure due to the introduction of this weapon, for Mr. Peard sold no less than 98 revolvers in King William's Town alone. One of Colt's large holster pistols was tried in the presence of some Caffres at a mark 400 yards distant, and they declared it was "God's pistol." A correspondent from Graham's Town, writing about the performances of the revolver, states that Mr. Peard made 21 hits out of 24 shots in a target of a barrel head at 206 yards distance, and asks when Colt's revolvers are to be used exclusively in the army and navy.

New Foundry.

Messrs. Guyon, Boardman, & Co., have commenced the erection of an extensive building, intended for the manufacture of steam engines. This building is located at the foot of Eighth street, this city, on the lot of ground formerly Collins' ship yard, and will be two hundred feet front on 8th street, by 94¼ feet deep on Lewis street, and is to be three stories high. In this building will be a brass foundry, machine shop, blacksmith's shop, storage buildings, &c. Mr. Guyon, of this firm, has for many years been connected with the Morgan Iron Works, and, it is stated, has planned many of their best engines.

Mountain of Marble.

J. D. Manlove gives the "St. Louis Intelligencer" a description of a mountain of marble, which, he says, exists in the Great Salt Lake Valley. He says the marble is of almost every color and shade, in slabs of very large area, and from an inch in thickness to blocks of an immense size. Mr. Manlove judges the marble to be of the best quality, and that it is inexhaustible.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JANUARY 11, 1853.

RAKES TO HARVESTERS—By T. Baylis & Daniel Williams, of Tecumseh, Mich.: We claim the construction and method of operating the rake, together with the use of the jointed brake, in facilitating the discharge of the sheaf at the rear of the machine, as set forth.

LATHES FOR INTERIOR AND EXTERIOR SURFACES—By Nathan Chapin, of New York City: I claim constructing the clamping heads with a V projection on the interior face, in combination with the orifices to act through said clamps and V projection, for the purpose of introducing key slats, in order to retain the piece firmly in position, during the operation of turning the interior and exterior surfaces.

Second, I claim giving to the sliding and vibrating interior cutter, suspended on the stationary mandrel motion, corresponding to the pattern to be turned, by a rod passing through the stationary mandrel, as described.

GALVANIC BATTERIES—By Moses G. Farmer, of Salem, Mass.: I claim the improved cell, made as described, viz.: with a part only of it porous, or so as to permit the electricity to pass from the nitric acid or liquid within it through such part, and into the liquid surrounding the cell, the remainder of the cell being made by glazing or other means, impervious to the passage of electricity, and acid or liquid through it, as specified.

SCYTHE FASTENINGS—By P. Frost, of Springfield, Vt.: I claim the peculiar construction of the loop and the set ring, with the grooves, in the manner set forth.

CIRCULAR SAWS—By Ammi M. George, of Nashua N. H.: I claim in combination with a circular saw, driven by friction, near its periphery, the guard plate with its arbor, around which the saw runs, and by which it is held into the wood, and on which the board or veneer, being sawed, may rest and relieve the saw from all friction therefrom, and by which means I am enabled to cut boards or veneers, of nearly equal width with the diameter of the saw, as described.

FIRE POLISHING GLASS—By J. L. Gilliland, of Brooklyn, N. Y.: I claim the method substantially as described, of fire-polishing glass by means of a rotating table, provided with a hollow handle, or its equivalent and gear, by which said table can be rotated as described.

BUCKLES—By Peter P. R Hayden, of New York City: I claim constructing the buckle in the manner described, viz., by uniting or connecting the two ends of the body of the buckle, by means of a boss formed at each of the two ends of the body, said bosses being in contact with each other, and forming a bulb, around which one end of the tongue is clasped, the end of the tongue, which surrounds the bulb, having a recess or groove in its inner surface, which conforms to the convexity of the bulb. and keeps or binds the bosses firmly together, and also keeps the tongue in its proper place.

MANURE SPREADERS—By Silas A. Hedges, of Lancaster, Ohio: I claim constructing a manure cart with two bodies, the front one of which is raised or tilted, for the discharge of manure into the rear one, by the action of the hind axle, by means of another axle and tackle, when thrown into gear by the hand lever, arranged as set forth.

I also particularly claim the combination of the endless apron, the tilting body, and raising the tail-board simultaneously with throwing in gear the endless slotted apron, as set forth.

COPYING PAPER—By Wm. Mann, of Philadelphia, Pa. Ante-dated July 11, 1852: I claim the copying paper described, composed of Manilla fibre, or the equivalent thereof, tempered with cotton or its equivalent, as set forth.

SCREW CUTTING DIES—By Andrew Mayer, of Philadelphia, Pa.: I claim arranging solid dies between the side plates, or their equivalents of a stock, in such manner that they are free to play, to a limited distance, in a plane perpendicular to the axis of the bolt or pipe, to be screwed, while they are, at the same time, incapable of revolution in the same plane, as described.

STEAM BOILERS—By Rich'd Montgomery, of New York City: I claim rivetting together the overlapping flanges of the opposite sides of the sheet flues in steam boilers in the manner described, whereby the flues are firmly attached each to each, and the usual flue sheet is dispensed with; and also certain advantages in construction attained in other parts of the boiler, as described.

Also the method of connecting a series of flues and water spaces with the roof or arch of the fire box, by means of tongues which project from the latter, and are secured, alternately, to the faces of the water spaces and to the tops of the flues.

SMUT MACHINES—By Dan Pease, Jr., of Floyd, N. Y.: I claim the employment of the adjustable deflector set at an angle to throw the grain in different directions, in combination with the receiver, the top of the said receiver being adjustable to any height desired, and the front piece of the same being set in such a position, in relation to the deflector that it will, when the grain strikes the deflector, be thrown against the said plane surface, which, from its peculiar position, will throw the grain in a partially spread state, up against the adjustable top, which causes it to spread still more, and then to fall down on the ribbed bottom, and pass off through the wind pipe.

Also, causing the grain to spread to a greater or less degree, by making the top of the receiver adjustable to different heights, as described.

Improved Mode of Making Brick.

A new machine for the manufacture of bricks by the application of Dick's powerful press, is being constructed under the direction of J. E. Holmes, at Hadley Fall, for a gentleman of Taunton, Mass. By this machine above 50,000 bricks can be made per day, with a pressure of 1,400 tons, exerted on every six bricks. A full description of this new building material, as it may be properly designated, and of the apparatus by which it is made, will be given by us in the course of a few months.

Patent Office Report.

As noticed by us last week, we will quote some of the remarks of Ex-Commissioner Ewbank, in a letter to the Secretary of the Interior. He says, "If systematic endeavors to overawe and overrule the Commissioner be not frowned down, they will, in time, effect the integrity of the Patent Office, and will make it a source of injustice to the public, and of grievous wrong to real inventors. Its judicial character requires that it be cordially sustained, and zealously protected from improper influences."

"If the Commissioner and chief officers are not competent to perform, or are not faithful to discharge their duties, they should be removed; but if they are able and honest, they ought not to be harrassed with calls to answer complaints preferred to the Department of the Interior, and often to the President, by disappointed applicants and their friends, nor is there the slightest grounds for coercion, since, if the Office improperly refuse a patent, the law has provided a Court of Appeal, in which its decisions can be revised and reversed."

We say that the system of appealing is unjust, inasmuch as all the expense comes upon the appellant, or inventor, and none upon the Patent Office; yea, and even when successful, the appellant has to pay the appeal fee to the Patent Offie—to the parties for making a wrong decision, that is beautiful justice. We don't like the wheel-within-wheel system of coercion as spoken of here. This government frowning, and lick-spittle interference with the Patent Office is anti-republican in essence and spirit.

ADDITIONAL ROOM REQUIRED.—It will be recollected by our readers that the present Secretary of the Interior, attempted to get a Bill passed through Congress granting him, for his Department, the use of the new wing of the Patent Office. It was said by him that there was plenty of room both for the Patent Office and his also. We took strong grounds against his Bill, and pointed out the incorrectness of its general statements. The "National Intelligencer" (not the "Republic," as mentioned by us last week), came out in defence of the application of the Secretary of the Interior, and tried to defend it as being in accordance with law. We exposed the fallacy of such reasoning; but the principle—that which we now wish to make plain—was the request of the Secretary of the Interior for the wing of the Patent Office, coupled with the assertion that there was *plenty of room* for his department and the Patent Office business also. This Report of the Commissioner says, —"they are so embarrassed for want of room that, for twelve months, the mails have been made up in an open passage,—where the correspondence and daily cash remittances are unavoidably exposed—if more room is not soon provided, it will prove a positive interruption to the business of the Office; such an exhibition of the models as was contemplated by the law of 1836, is not only impossible, but it is scarcely practicable to protect the delicate models from destruction. The condition of these models is a great injustice to their authors, and to inventors and patentees generally, since the rooms and cases prepared expressly for them at the expense of the Patent Fund, have now been withheld from the Office for a period of ten years."

The whole force of the Patent Office also united—and their letter is published in this Report—in urging the providing of more room for their business. Their report states—"the patented models now in the Office are so crowded that the provision of the law with respect to the exhibition of them, cannot be complied with, and the rejected models are in a worse condition. Three times the present space is wanted for the Library, and double for the Draughtsmen's Room. The copying clerks are now crowded into the rooms of other officers. Rooms are required for workshops, caveats, models, and pending models."

How does this accord with the demand for the new wing of the Patent Office for the offices of the Department of the Interior? Our inventors and patentees have been deeply wronged, already, in appropriating for other uses the Exhibition Room for Models,—it is now the National Museum, which should have a building exclusively for itself. There are now 20,000 models in the Patent Office, and in ten years it is supposed their number will be 40,000,—as they are increasing at the rate of 2,000 per annum. The value of the 20,000 models, we presume, cannot be less than $1,000,000; but what of that? They only relate to the progress of invention (that which has made our country great), and as they do not relate to party politics, why, let 6,000 rot in the cellars. It is a great mistake to suppose that the treatment of inventors does not influence politics; we know to the contrary, but some leading politicians have not the gumption to perceive this.

In 1851, 2258 applications were made for patents; out of this number 760 were granted, thus making the rejections to be 1491, nearly two to one. The hasty rejection of some applications causes more trouble to the Office than it otherwise would; and many applications for patents have been rejected which should not have been. The surplus of the Office Fund for the year amounted to $8,881 68, over all expenditures; our inventors pay all their own taxes in connection with patents, yet they have been often treated as if they were paupers. We hope that better days are in store for them; we feel amply repaid for what we said about appropriating the Patent Office to the service of the Department of the Interior, by the prevention of such an outrage upon inventors' rights.

Effect of the Earth's Rotation on Locomotion.

Until this week we did not see a short article published in a monthly magazine in this city a month ago, by one signing himself W. B. S., of Boston, wherein he states "the Editor of the Scientific American misunderstood Mr. Clark's meaning about the effects of the earth's rotation on locomotion." He, it seems, understands Mr. Clark's meaning to a diamond shaving, and here it is. He says, "If the engine is running north from one place to another at which the rotative velocity is less, the engine will have a greater rotative velocity than the portions of the track with which it comes in contact, and will therefore exert a slight but imperceptible force against the easterly or right hand rail. On the return of the engine the rotative velocity of the track will be greater than that of the engine, hence the engine will now press the westerly or right hand rail, with a force equal to the difference between the rotative velocity of the track and that of the engine." This explanation is certainly made in accordance with that rule, which works both ways, an exceedingly convenient one for superficial reasoners. By this logic, when the locomotive is running to the north and parting at every point of its journey with increments of rotative force, the said engine climbs the right hand rail in the direction of the earth's rotation, but when the locomotive is coming back on the same road, and is receiving increments of rotative force at every advancing point (in the same direction as before,) it climbs the opposite rail. That is, the effect of the earth's rotation on a locomotive causes it to climb the rail to one side while travelling in one direction, and the opposite rail when travelling in the contrary direction. We confess that this is not an exhibition of the effect of the earth's rotation on locomotion, but the effect of locomotion on the earth's rotation.—The earth keeps rotating in the same direction, but this critic, who understands Mr. Clark's meaning so well, makes his locomotive act with and against the earth's rotation, just by moving backwards and forwards.

New Locomotive.

A locomotive of a new description has been lately patented by Messrs. Remsen & Hutton of Troy, N. Y., a working model of which is now on exhibition at No. 6 Wall street. An account of this invention was given some time back, in the Scientific American, as will be seen by referring to page 260, Vol. 7, under the head of New Inventions. The theory propounded by the patentees is, that the steam is more effectually employed in moving the crank during what is often termed the upper part of its revolution, than when it assumes the position below the horizontal. Or, in other words, they employ the power transmitted from the piston to pull the crank, but not to push it, so that the movement of each piston is effectual only when travelling in the same direction as the train. To attain this end, the patentees employ the single action principle, admitting the steam to only one end of the piston. Of course either can be used, as it is necessary at times to reverse the engine, but, as a rule, the steam is admitted only above the piston, which they consider to realize a greater percentage of the power. Three cylinders are employed, one for each driving-wheel, and a third, which is situated between the other two acts on the axle, an arrangement that is, in reality, equivalent to a three-throw crank, the nature of which is well understood by all locomotive engineers.

The Scientific American--Prizes to Apprentices.

MESSRS. MUNN & Co.—It has often made me sad to see so many of our apprentice boys idle away their useful moments while out of shop. If a young man wishes to be master of his business, he must be attentive to store his mind with useful information, derived from reading, good conversation, and experiment. But our young men from eighteen to twenty one years (I admit there are some noble exceptions—I speak of the mass,) spend their spare moments in enjoying themselves—as it is called, among silly people—or in reading trifling books, or nonsensical love stories.—This age in a man's life has a potent influence according to the way it is improved or misimproved, on his future welfare, his value to himself, his relatives, and country. A young man who completes his apprenticeship carrying with him a character of excellence for industry, honesty, and skill, is worth his weight in gold to himself, friends, and country.

With the favor of the Scientific American, I say unto you—young men of our glorious land, make up your minds, take your stand ~~with a firm determination to~~ spend your spare moments in useful reading, reflection, good conversation, writing, draughting, &c., and to work faithfully and honestly during working hours, so as to become competent, skilful, and intelligent workmen. *Our* manufacturers are calling loud for master mechanics, but qualified men are not easily found. Young mechanics think of this; the innocent amusements are yours, they do good; but do not neglect to improve the moments by wasting them in trifling pleasures.

E. H., of Pa.

N. B. I hereby send for five copies of the Scientific American, which I will present to apprentices in our coach factory, believing they will be to them of great benefit.

Foreign Patent Laws.

The recent change in the English Cabinet will undoubtedly effect a complete change in the officers having charge of the patent department, and the public may expect a more liberal and enlightened construction of the Patent Law Amendment Act, and that odeous feature which excludes inventors from the colonies recinded—which it will undoubtedly be. Inventors and manufacturers having patent businesss to transact in any foreign country, are invited to counsel with the proprietors of this paper, as they possess superior facilities for securing patents. All communications confidentially treated.

The New Steamboat Law.

This law, passed by last Congress, and which was to go into effect on the 1st inst., has been taken up in Congress again, and by a joint resolution of the Senate and the House of Representatives, the inspectors are allowed, in certain cases, to excuse steamboat owners or non-compliance with the law, for ninety days after the date (1st Jan., 1853) when the law should have gone into effect. Some of its provisions require altering as well as delay.

New Railroad.

Measures are being instituted for the immediate construction of a railroad between Portsmouth and Dover, N. H.

TO CORRESPONDENTS.

J. H. F., of Vt.—You will find Prof. Wright correct when you make careful experiments. Not being acquainted with your plan, we could not give you an answer.

J. G. J., of Ill.—It is a mistake which we have often seen made, to suppose that one part of a machine rotating, but to work in combination with another main part having a reciprocating motion, does its work quicker than a machine wholly reciprocating. Your platten has a reciprocating motion, and your cylinder cannot be made to work faster than it. Your press, however, appears to be a good one; but you know that many mechanical combinations really require experiments to determine their superiority; some combinations, however, are so plain that we can at once point out their virtues or defects.

A. C., of Conn.—It is our opinion that your boiler is a good one; we judge this by your description and sketch, the latter being very imperfect. A model should be made as soon as possible. The Air Condenser will not answer; air is not a suitable medium for taking up the heat rapidly; it is a bad conductor.

J. P., of Miss.—Your letter asking information about Camp's invention is received, we cannot furnish any information respecting it not found in the Sci. Am, to which you refer, therefore we have passed the $1 to your credit on account of subscription.

A. W. Z., of N. Y.—For taking photographs on glass, a solution of gun cotton, called collodion, is employed.

R. M., of Me.—It is a mooted point whether there is such a substance as ozone in the air, or whether it is only oxygen modified or changed by electricity.

W. B. S., of Ga.—A substitute for the American cotton gin has been attempted in the East Indies, but has not succeeded. The English East India Co' have offered a large reward for an improved cotton gin that will suit cotton grown in the East Indies, for which the one now in use is not altogether suitable.

R. B., of La.—A centrifugal refrigerator has been lately patented in England.

R. S. T., of Me.—"Hydrated" signifies containing moisture, and "anhydrated" deprived of the same.

W. L., of N. H.—Sulphuric acid and oil of vitriol are the same.

I. M. P., of Tenn.—We do not think your plan will interfere with any other in use; so far as we understand it the plan seems to be good.

W. S., of Me.—We think your device possesses novelty sufficiently to warrant an application for Letters Patent. You had better send us a model.

W. McB., of Ohio—The sketch of your "Choir Time Keeper" has been carefully examined, and is believed to possess novelty of a patentable character. We apprehend, however, that a patent would be of little or no pecuniary value. We see little in it which is valuable as an article of merchandise.

J. C. C., of Ind.—All right.

L. D. H., of Vt.—We think if you should use the fire box and chimney you would infringe one of the patents issued, but perhaps not *the* one referred to by you.

P. B., of Schenectady—As yet we have had no tidings from the Patent Office, concerning your case since the papers and model were acknowledged. Hope to hear soon: should think it was time it had been examined.

M. C. R., of Ohio—The plan you offer as a substitute for the crank is old and useless; it has been re-invented hundreds of times, and we have now in our office several models of it.

T., of N. Y.—The glass is French; we have seen no other. Cannot you get the chemicals pure from E. N. Kent, in John street? We believe you can. You are right about the Hillotype, but it would not do to use such strong language as you do.

J. S., of Ky.—Yours will receive its place.

H. S. H., of N. Y.—When an individual advertises the sale of a valuable invention as low as a dollar, for a right to use it, we are apprehensive there is some humbug about it, and don't like to be accessory to such schemes by inserting their advertisements in the Scientific American. The money you sent us is subject to your order.

E. Van C., of Pa.—You are at liberty to introduce your invention on any of the railroads that will adopt it. Engravings of your apparatus would cost $15; no charge made for publishing.

P. D., of Pa.—We have no desire to publish your article, others beside yourself entertain the opinion that light is a subtle matter, and we must say, that we have seen the subject more ingeniously treated.

O. Y., of N. Y.—O. B. T.'s claim could not extend farther than its application to the felt for the specific purpose mentioned, or any like purpose that he could certainly claim.

L. L. M., of N. C.—The undulatory theory, or that light moves in waves, has been very ingeniously propounded by Fresnel, a French writer on the subject.

M. A., of N. H.—By the wheel and axle any one continued rectilinear motion may be made to produce another in any other direction, and with any other velocity.

S. W. T., of S. C.—The place to be assigned to a fly wheel relatively to the other parts of the machinery is determined for the purpose for which it is used.

R. A., of Ala.—By the term "latent heat," is meant that which is insensible to the touch, or cannot be discovered by the thermometer.

B. W., of Mass.—The theory of mechanics is founded upon mathematical science, and consequently a knowledge of geometry is necessary to understand it thoroughly.

R. L. T., of S. C.—Bodies that radiate heat best, likewise absorb it best.

A. M., of Miss.—Wintergreen grows abundantly in some parts of New Jersey, its extract is highly esteemed for many purposes.

S. P., of N. Y.—We do not know of a wood planing machine like yours, but the same principle is embraced in Eayrs' stone dressing machine published in our last volume.

R. I., of Va.—We do not know the plow by the name mentioned. You had better offer something, say $50, for the best plan for a furnace—we know of no one who would undertake it, although there are many.

B. L. W., of Miss.—The best writer to consult on the application of manures is Sir H. Davy, in his Agricultural Chemistry.

Money received on account of Patent Office business for the week ending Saturday, Jan. 15:

W. R., of Mass., $15; G. R., of N. Y., $35; J. O., of Ct., $20; W. S. P., of Ct., $30; W. M. W., of Ct, $20; G. N. L. D., of N. Y., $20; B. B., of N. Y., $30; F. O. L., of Pa, $30; J. B. T., of N. Y., $25; I. H., of O., $45; G. B. S., of N. Y., $25, C. & R., of Mass., $25; F. J. T., of N. Y., $20; A. C., of N. Y., $35.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Jan. 15:

W. P., of Mo.; G. N. L. D., of N. Y.; J. B. T., of N. Y.; A. C., of N. Y.; I. H., of O.; G. B. S., of N. Y.; F. J. T., of N. Y.; C. & R., of Mass.

A Chapter of Suggestions, &c.

PATENT CLAIMS—Persons desiring the claims of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office—stating the name of the patentee, and enclosing one dollar as fee for copying

PATENTEES—Remember we are always willing to execute and publish engravings of your inventions, provided they are on interesting subjects, and have never appeared in any other publication. No engravings are inserted in our columns that have appeared in any other journal in this country, and we must be permitted to have the engraving executed to suit our own columns in size and style. Barely the expense of the engraving is charged by us, and the wood-cuts may be claimed by the inventor, and subsequently used to advantage in other journals.

BACK NUMBERS AND VOLUMES—In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:—Of Volumes 1, 2 and 3—none. Of Volume 4, about 20 Nos., price 50 cts. Of Volume 5, all but four numbers, price, in sheets, $1. Of Volume 6, all; price in sheets, $2; bound, $2,75 Of Vol. 7, all; price in sheets, $2; bound, $2,75. Of Vol. 8, all the back numbers to January 1st (No. 16), but none previous.

GIVE INTELLIGIBLE DIRECTIONS—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure, but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

PATENT LAWS, AND GUIDE TO INVENTORS.—We publish, and have for sale, the Patent Laws of the United States. The pamphlet contains not only the laws but all information touching the rules and regulation of the Patent Office. Price 12 1-2 cts. per copy.

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American and Foreign Patent Agency

IMPORTANT TO INVENTORS.—The undersigned having for several years been extensively engaged in procuring Letters Patent for new mechanical and chemical inventions, offer their services to inventors upon the most reasonable terms. All business entrusted to their charge is strictly confidential. Private consultations are held with inventors at their office from 9 A. M., until 4 P. M. Inventors, however, need not incur the expense of attending in person, as the preliminaries can all be arranged by letter. Models can be sent with safety by express or any other convenient medium. They should not be over 1 foot square in size, if possible.

Having Agents located in the chief cities of Europe, our facilities for obtaining Foreign Patents are unequalled. This branch of our business receives the especial attention of one of the members of the firm, who is prepared to advise with inventors and manufacturers at all times, relating to Foreign Patents.

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128 Fulton street, New York.

BACK VOLUMES OF THE SCIENTIFIC AMERICAN for sale—Vols. 2, 5, 6, and 7, complete, price $2,50 per volume; Vol. 3, less 10 or 12 numbers, and Vol. 4, less 4 or 5 numbers; price $1,50 each; all bound and in good order. Address, post-paid. F. S. BURRELL, Albany, N. Y. 19 4*

ENAMELLED IRON—A man with a thorough practical knowledge of enamelling iron hollow ware in the most durable and brilliant manner, as performed in the celebrated enamel works of Gleiwitz, in Silesia, wants to get employment or to sell his improved process. Address A. SCHELLER.
1* box 1276, St. Louis, Mo.

NEW BRICK MACHINE—For a full description see Sci. Am., No. 49, and engraving No. 52, last Vol. A six-mould machine, driven by steam, makes 15,000 a day; cost, $500 without engine. A 5-mould by two horses attached to a sweep, worked by two men and five boys, makes 10,000 a day; cost, $300. A 4-mould, by one horse, one man and five boys, makes 8000 a day; cost, $250; may be mounted on wheels and moved about, Persons remote may be supplied with model, drawings, and set of patterns or castings. Maryland Institute, Nov. 24.

To the Committee on Awards—By your request we have made a re-examination of the Brick Machine of Mr. F. H. Smith. The work is now done in the most efficient manner and by the slightest improvement imaginable. A further improvement is in the method of delivering the bricks from the moulds, which goes far to facilitate the entire operation. We are of opinion that the machine will prove a great acquisition to those engaged in the business, especially in country places where they have not the benefit of experienced hands, as the whole is performed by ordinary labor The bricks made by it are well formed, substantial, and all that can be desired. —Wm. Slicer, L. P. Clark, John C. Ely, Thos. Winans, C. Reeder. December 17th—By unanimous vote Gold Medal awarded.

Address, FRANCIS H. SMITH,
17 3eow* Baltimore.

IRON FOUNDERS MATERIALS—viz.: Scotch and American Pig Iron, of favorite brands; Scotch patent Fire Bricks—square, arch, and circular. Fire Clay and Fire Sand; Moulding Sand for Iron and Brass Founders: Core Sand and Flour. Pulverized Black Lead, Soapstone, Sea Coal, Anthracite, and Charcoal Bolted Facings of approved quality, for sale by G. O ROBERTSON, & CO., office 135 Water street, (corner of Pine), N. Y. 19 6eow*

CLOCKS FOR CHURCHES, COURT HOUSES, AND OTHER PUBLIC BUILDINGS, Time-Pieces for Session and Vestry Rooms Hotels, Railroads etc.; Regulators for astronomical purposes, Jewellers, and others, when the most perfect time is desired. The improvements introduced by the subscribers, enable them to warrant an accuracy of time-keeping, unequalled (so far as they can learn) in Europe or America. Glass dials, for illuminating and other kinds, furnished. Address SHERRY & BYRAM, Oakland Works, Sag Harbor, Long Island.

"At the Oakland Works of Sherry & Byram there are made some of the finest clocks in the world." —[Scientific American. 19 13eow

SURFACE CONDENSERS—Having built and used at our machine shop and foundry one of J. M. Miller's Surface Condensers for the last 14 months, we are now prepared to receive orders for building and putting up said condensers on either high or low pressure engines now in use, and warrant the same against expansion and contraction of the metals, also the injurious effects of oil in the tubes, which alone has caused the failure of condensers heretofore used. We have also found, in the use of our Condenser a nett saving of 30 per cent. of fuel, the water being kept pure and regular in the boiler by the condensation of the steam. In our judgment this Condenser is the perfecting of the Steam Engine. COBB, MASON & HILL,
North Point Foundry and Machine Works,
18 4 Jersey City, N. J.

W. P. N. FITZGERALD, Counsellor at Law, has recently resigned the office of principal Examiner of Patents, which he has held for many years, and is ready to assist, professionally, in the preparation and trial of patent causes before the U. S. Courts in any of the States, and before the Supreme Court of the United States. He also acts as Counsel in cases before the Patent Office, and on appeals therefrom, but does not prepare applications for Patents Office corner of E and 8th sts., Washington, D. C. 18 tf

FOR SALE—A second-hand Locomotive Boiler, 10 or 12 horse-power, with safety-valve, grate-bar, &c., in complete order; will be sold cheap. Also, four largest size Mott's Furnace Kettles, 150 gallons. ROBINSON & WINANT,
18 2* 105 Freeman st, Brooklyn.

PATENT DRAFT BOARDS—With extension scales, sheet fasteners, and T rule. See Reports of Worcester Fair, Maryland State Fair, &c. &c. with their awards. $10 complete. Sent by express. Address, post-paid, CHAMBERLIN & CO., Pittsfield, Mass. 16tf

J. D. WHITE'S PATENT CAR AXLE LATHES—also Patent Engine Screw Lathes, for boring and turning tapers, cutting screws, &c. We manufacture and keep constantly on hand the above lathes; also double slide Chuck and common Hand Lathes, Iron Planers, S. Ingersol's Patent Universal Ratchet Drill, &c. Weight of Axle Lathe, 5,500 lbs; price $600; Engine Screw Lathe, 1400 to 7,000 lbs; price $225 to $675, BROWN & WHITE,
15tf Windsor Locks, Conn.

STEAM ENGINES FOR SALE—We offer for sale two Engines and Boilers, as follows: one 8 horse, horizontal, cylinder 7 inches bore, 16 inch stroke, on a cast-iron bed, fly wheel, driving pulley, governor, pump, pipes, etc.; has never been used. The Boiler has been used by the maker about one year. It is cylinder, horizontal, 16 feet long, 30 inch diameter, has a steam chamber, try-cocks, check and safety valves: price, $600.

One 7 horse Horizontal Engine, 6 inch bore, 16 inch stroke, cast iron bed-plate, driving pulley, etc. Boiler horizontal, tubular, and has everything complete for putting it in operation. The engine is new, the boiler has been used, but is in good order. Price $500. They are rare bargains, and will give satisfaction to the purchaser, being much less than new ones can be obtained. Address MUNN & CO.

THE TROY IRON BRIDGE CO. are prepared to erect Iron Bridges or Roofs, or any kind of bearing trusses, girders, or beams, to span one thousand feet or under, of any required strength, in any part of the country. Their bridges will be subjected to severe tests, and can be built for about the price of good wooden ones. Address BLANCHARD & FELLOWS, Troy, N. Y. 7 20*

BEARDSLEE'S PATENT PLANING Tongueing and Grooving Machines—These celebrated machines have now been generally introduced in various portions of the United States. More than thirty are now in successful practical operation in the State of New York alone. As an illustration of the extent of work which they are capable of performing, with unrivalled perfection, it is sufficient to state that, within the last six months and a half, over five millions of feet of spruce flooring have been planed, tongued and grooved by one of these machines at Plattsburgh, N. Y., never running to exceed ten hours a day. The claim that the Beardslee machine was an infringement upon the Woodworth patent, has been finally abandoned; and after the proofs had been taken, the suit instituted by the owners of that patent was discontinued, and the whole controversy terminated on the first of November last. Applications for machines or rights may be made to the subscriber, GEO. W. BEARDSLEE, 57 State street, or No. 764 Broadway, Albany. 15tf

EXHIBITION OF WORKS OF AMERICAN Industry at Washington City.—The first exhibition of the Metropolitan Mechanics' Institute will be opened on Thursday, the 24th of February, 1853, in the new and splendid hall of the east wing of the Patent Office, one of the largest and most magnificent rooms in the United States, being 275 feet long by 70 feet wide. To this exhibition the manufacturers, mechanics, artists, and inventors, from all portions of the Union, are cordially invited to contribute. The hall will be opened for the reception of goods on Monday, tha 14th of February, and the exhibition will positively close on or before Thursday night, March 17. Circulars, containing detailed instructions, will be forwarded and any further information given, on application (post-paid) to the Corresponding Secretary, Charles F. Stansbury, to whom all communications on the business of the Institute should be addressed 8tf

WOODBURY'S PATENT PLANING Machines—I have recently improved the manufacture of my Patent Planing Machines, making them strong and easy to operate, and am now ready to sell my 24 inch Surfacing Machines for $700, and 14 inch Surfacing Machines for $650 each. I will warrant, by a special contract, that ONE of my aforesaid machines will plane as many boards or plank as two of the Woodworth machines in the same time, and do it better and with less power. I also manufacture a superior Tonguing and Grooving Machine for $350, which can be either attached to the Planing Machine, or worked separately. JOSEPH P. WOODBURY, Patentee, Border st, East Boston, Mass. 13tf

MACHINERY.—S. C. HILLS, No. 12 Platt-st. N. Y. dealer in Steam Engines, Boilers, Iron Planers, Lathes, Universal Chucks, Drills; Kase's, Von Schmidt's and other Pumps; Johnson's Shingle Machines; Woodworth's, Daniel's and Law's Planing machines; Dick's Presses, Punches and Shears; Morticing and Tennoning machines; Belting; machinery oil, Beal's patent Cob and Corn mills; Burr mill and Grindstones; Lead and Iron Pipe &c. Letters to be noticed must be post-paid. 13tf

A. B. ELY, Counsellor at Law, 52 Washington st., Boston, will give particular attention to Patent Cases. Refers to Munn & Co., Scientific American. 16tf

LEONARD'S MACHINERY DEPOT, 109 Pearl-st. and 60 Beaver, N. Y.—Leather Banding Manufactory, N. Y.—Machinists's Tools, a large assortment from the "Lowell Machine Shop," and other celebrated makers. Also a general supply of mechanics' and manufacturers' articles, and a superior quality of oak-tanned Leather Belting.
7tf P. A. LEONARD.

PAINTS, &c. &c.—American Atomic Drier Graining Colors, Anti-friction Paste, Gold Size, Zinc Drier, and Stove Polish.
QUARTERMAN & SON, 114 John st.,
1tf Painters and Chemists.

LATHES FOR BROOM HANDLES, Etc.—We continue to sell Alcott's Concentric Lathe, which is adapted to turning Windsor Chair Legs, Pillars, Rods and Rounds; Hoe Handles, Fork Handles and Broom Handles.

This Lathe is capable of turning under two inches diameter, with only the trouble of changing the dies and pattern to the size required. It will turn smooth over swells or depressions of 3-4 to the inch and work as smoothly as on a straight line—and does excellent work. Sold without frames for the low price of $25—boxed and shipped with directions for setting up. Address (post.paid) MUNN & CO.
At this Office.

FALES & GRAY (Successors to TRACY & FALES), RAILROAD CAR MANUFACTURERS—Grove Works, Hartford, Connecticut. Passenger, freight, and all other descriptions of railroad cars and locomotive tenders made to order promptly. 1tf

SHINGLES, SHINGLES, SHINGLES—WOOD'S latest improvement in Shingle Machines is becoming more generally used than any other ever invented, and is unquestionably the best machine now in use; it produces shingles from all kinds of timber in a very perfect and rapid manner. Machines and rights for sale. Apply to JAMES D. JOHNSON, Bridgeport, Ct. 9tf

C. B. HUTCHINSON'S PATENT STAVE Cutting Machines, the best in use, and applicable alike to thick or thin staves; also his Head Cutting and Turning, and Stave Jointing Machines.

For machines or territorial rights, apply to C B. HUTCHINSON & CO., Syracuse, N. Y. 9tf

POSTAGE STAMPS.—Post Office Stamps, of the denomination of 1, 3, or 12 cents, may be had at par by addressing MUNN & CO., Scientific American Office.

NEW HAVEN MANUFACTURING COMpany, Tool Builders, New Haven, Conn., (successors to Scranton & Parshley) have now on hand $25,000 worth of Machinist's Tools, consisting of power planers, to plane from 5 to 12 feet; slide lathes from 6 to 18 feet long; 3 size hand lathes, with or without shears; counter shafts, to fit all sizes and kinds of universal chuck gear cutting engines; drill presses, index plates, bolt cutters, and 3 size slide rests. The Co are also manufacturing steam engines. All of the above tools are of the best quality, and are for sale at 25 per cent. less than any other tools in the market. Cuts and list of prices can be had by addressing as above, post-paid. Warehouse No. 12 Platt st., New York, S. C. HILLS, Agent N. H. Man'g Co. 19tf

SCIENTIFIC MUSEUM.

Process for Testing Iodine.

The following method of testing iodine that has been adulterated with water, is given in the "Industrie Suisse." It is well known that the dearer a chemical becomes the more it is adulterated, and from the increasing rise in the price of iodine, the attempts to adulterate it are becoming more numerous. The greater part of the substances employed for this purpose being neither soluble in alcohol nor susceptible of volatilization by heat, it is easy to discover them and to determine the quantity by the ordinary processes. Adulteration by water is the most frequent, and, at the same time the most difficult to discover with certainty, amounting, according to some writers, to as much as 10 and 12 per cent. Pulverized iodine, in fact, absorbs a large quantity without appearing humid, and the means of determining the proportion in which this substance is adulterated with water are very defective. Although iodine requires a higher temperature than water to reach the boiling point, the latter does not evaporate without drawing off at the same time a noticeable part of iodine, which partakes, with other bodies, in the property of easily evaporating when exposed to the steam of water, although much less volatile. N. A. Chevallier advises placing a certain quantity of iodine that has been previously weighed, between some sheets of blotting paper, to press it firmly, and then weigh it over again. It is clear, without being necessary to make any attempt to prove it, that there must be lost, in this manner, a large quantity of iodine, and that the resulting proportion would not be exact. Another process consists in pulverizing the iodine with a double weight of chloride of calcium, to place the whole in a tubular retort and to heat to 180° (Celsius). The iodine will change to vapor, and the chlorine remain colorless with the water. Only it is very important to take precautions that the water itself should not evaporate, this method has, however, its difficulties, for it requires a long time to loosen the neck of the retort. The following method is short and simple, as well as tolerably exact: Weigh about 1 dwt. of iodine in a small open porcelain vessel, and after having done so, leave it on the scale. Add to this half an ounce of mercury, and afterwards place the pestle of a small agate mortar in like manner in the vessel, and determine the whole weight. Then take it, altogether, off the scale and pound up the iodine and mercury with the pestle; care must be taken to place the vessel on a sheet of white paper and to hold it with the left hand. Pound it up until the odor of the iodine has completely disappeared, the color that the mass assumes at first is a reddish brown, when it suddenly becomes thick, and exactly resembles an amalgam. It appears indispensable to obtain this latter result, that the mixture should be made in such a manner that the mercury be added to the iodine at least in the proportion of 7 to 1. That is to say, that the quantity of mercury should be much greater than in the preparation of yellow mercurialized iodine, where a similar phenomenon is not manifested. When there has been obtained a perfect union of the parts, the vessel is placed on a warm water bath, and after some time weighed again. The operation may be repeated without any evidence of a diminution of weight, especially if care has been taken to leave the vessel in the bath for half an hour before the first weighing. In the course of pounding, the entire mass is somewhat heated, and there results from this the loss of a small quantity of water, whilst the iodine, on the contrary, is very little volatilized by the operation. It is known that after the uniting again of the iodine with the mercury in the water bath, the former is no longer volatile; this fact is, moreover, proved by the piece of sized paper placed over the vessel as a cover. The inventor of the process, Dr. Bolley has made a course of experiments, which do not differ much in the results when the same iodine was used.

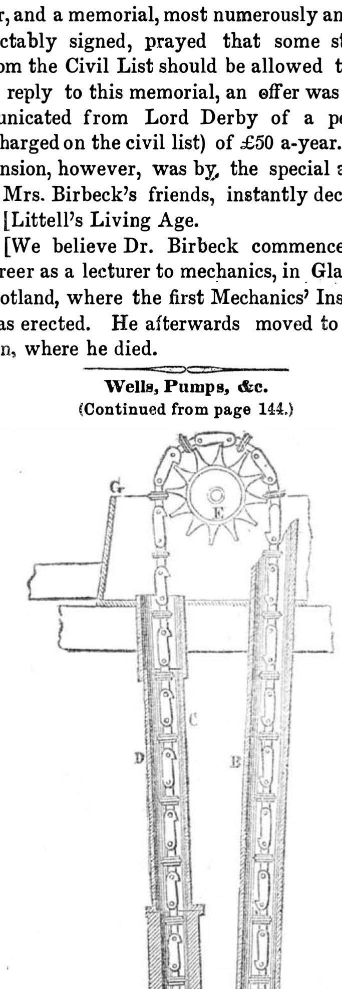
The Founder of Mechanics' Institutes.

The late Dr. Birbeck, the chief founder of the Mechanics' Institutes, and who, at his own cost, both in time and money, largely contributed to the spreading of education amongst English mechanics, died, we regret to say, impoverished, and leaving his widow without provision. A communication of the bereaved lady's position was made to the Prime Minister, and a memorial, most numerously and respectably signed, prayed that some stipend from the Civil List should be allowed to her. In reply to this memorial, an offer was communicated from Lord Derby of a pension (charged on the civil list) of £50 a-year. This pension, however, was by the special advice of Mrs. Birbeck's friends, instantly declined. —[Littell's Living Age.

[We believe Dr. Birbeck commenced his career as a lecturer to mechanics, in Glasgow, Scotland, where the first Mechanics' Institute was erected. He afterwards moved to London, where he died.

Wells, Pumps, &c.

(Continued from page 144.)



Chain Pump.—It is our design to publish engravings of some common pumps, so as to enable many to make them who have not had an opportunity of seeing drawings of the same. This engraving is that of the chain pump. It is only an endless chain or belt, A, with a sufficient number of pistons, called buckets, fixed upon the chain at proper distances apart. It passes down through a wooden tube, B, and returns upwards in the same manner in the other tube, D. The chain is extended over two wheels, E, F, one at the top and the other at the bottom. By turning the upper wheel, the chain of buckets is put in motion, and the lower part of the wooden tube in which the chain ascends is made in such a manner that the pistons, as they turn around below will push up the water into the tube, in which they are ascending, and then lift it up as they are moved upwards. The space between each piston or disc is a bucket in the inside of the tube. The pump is worked by a crank in the ordinary way. Many of these pumps are now used, a common chain being employed, with discs of iron galvanized, or an endless chain of gutta percha, with strong discs of india rubber for the pistons. Any person who can make a close tube so as to have the pistons work tight in the tube, can put up one of these pumps easily. A rope, a leather belt, or any endless belt will answer the purpose, but we like the gutta percha endless belt best. The pistons must be allowed to work easily in the tubes.

Hot Water in Paris.—The artesian wells of Grenelle, 600 yards French (nearly 2,000 feet English) in depth, continue to supply water of 30° Centigrade (86° Fah.) throughout the year. It being supposed that a large profit might be derived from a liberal supply of this natural hot water, a company is about being formed for the purpose of boring in each of the forty-eight districts (*quartiers*) of Paris, an Artesian well. These forty-eight wells are each to be one thousand French yards, or 3,300 English feet in depth, and are expected to yield water of a temperature varying from 176 to 212 Fah., the latter being the boiling point. The object in view is to establish hot water baths at 20 centimes (about four cents), public wash-houses or laundries—four in each district—furnish families with hot water, and finally to heat apartments, and buildings, by causing the hot water to circulate in tubes, as in the Palace of Luxembourg.

Patent Principles---Telegraphs.

A very important decision was made in the U. S. Supreme Court at Washington, on Tuesday, the 11th inst. An appeal was carried up by Henry O'Reilly, against a decision of a lower court, which granted an injunction to restrain the use of the Columbian Instrument, as an infringement of the Morse Telegraph Patent. The decision of the lower court was to the effect that "a patent covered an art." This decision has been reversed by the Supreme Court—*its* decision is, "an art is not patentable."

It will be recollected by our constant readers, that on page 61, of our last volume, it was stated that Judge Kane made a decision against the Bain Telegraph, which was in effect that an art is patentable, that Morse's patent covered recorded messages, independent of the manner or the principle embraced in the mode of doing the same.

On page 67, of the same volume, we reviewed his decision and pointed out the fallacy of his Honor's reasoning, and the dangerous principle to improvements involved by his fiat —a decision which we deemed unjust and unreasonable. By that decision, the whole of the property of the Bain line was given over to the complainants, and now it turns out the Supreme Court has decided that the decision of Judge Kane was founded upon erroneous principles. Judge Kane's words were:—"Morse's title is founded on two patentable subjects, the one the discovery of *a new art*, the second the means of practising it; *the art* is the recording of languages at telegraphic distances." We refer to his Honor's decision now, and to our criticism of it to notice one peculiar point. We said then, "we could not feel easy in conscience with such a decision, if we were in the complainants' place, to be awarded property which in justice did not belong to us, but it was a question which would be settled before a higher tribunal than that of an earthly court. We have great faith in moral principles, and in no single instance can we recollect of having been deceived in the ultimate results. Herrick Aiken, of Franklin, N. H., thought we were wrong in our conclusions, and we allowed him three whole columns on page 171, Vol. 7, Sci. Am., to prove that an art was patentable. On page 181 we pointed out the exceeding weakness of his reasoning, and want of correct information on the subject, and we concluded with these words: "We believe the *decision* and the compromise which has resulted from it (Judge Kane's decision) have deeply injured the rights of an inventor; it may look all prosperous just now to those who, in their worldly wisdom have planned things for their own success and benefit, but *we* have strong faith in the ultimate triumphs of justice." This faith has just been realized in the Supreme Court of the United States—the highest legal tribunal in our land—declaring the principle upon which Judge Kane based his decision, to be wrong, the decision of the Supreme Court is in accordance with the views expressed by us at the time, and on the page referred to above.

Old Apple Tree.

There is a bearing apple tree in Connecticut, alive and flourishing, at the advanced age of two hundred and fourteen years. It is of the English Pairmain variety, and was imported in 1638, by Governor George Wylley, and bore good fruit this season, on the "Charter Oak Place," now owned by Hon. T. W. Stuart, Hartford. Some of the fruit of this venerable tree was presented to the Connecticut Horticultural Society in October last.

The Iron Trade in England.

At a meeting of the So. Staffordshire, Worcestersire and Shropshire, held at Dunly on the 30th ult., it was resolved to advance prices 20s. per ton for the ensuing quarter.

In England they have a way of carbonizing gutta percha, and applying it to razor strops.

LITERARY NOTICES.

American Polytechnic Journal—This is the title of a new monthly magazine devoted to Science, Mechanic Arts, and Agriculture, conducted by Prof. Charles G. Page, J. J. Greenough, and C. L. Fleischmann. It is published in this city and Washington, at $3 per annum. We like this number well—it is edited with great ability. Prof. Page has an excellent and profound article on the "Acarus Crossi," in which he expresses views in accordance with our own respecting the superficial experiments and absurd conclusions of Reichenback. We wish our new cotemporary success.

Guide to Knowledge—By Eliza Robbins; 1 vol. 12mo.; price 62 1-2 cents. Appleton & Co., New York. This little work, in the form of question and answer, is a useful addition to our elementary school books. The present rising generation are more fortunate in this respect than their forefathers, for while, now, books suited to every capacity of learners can be counted by scores, there was a time when all elementary knowledge was supposed to be comprehended in the "Latin Grammar." The modern progress in the course of education, we look upon as the greatest event of our times, and the class of books that it has given rise to are often of a superior character. The above, however, is merely elementary for young persons, but although small it is encyclopediac, and contains much useful knowledge for children.

Hunt's Merchants' Magazine—Vol. 28, No. 1. Hunt's Merchants' Magazine has now entered on its 28th volume, and judging from the number just issued, the present volume, when finished, will not fail to be equal to its predecessors. As a periodical publication this magazine contains a vast amount of statistical information and excellent articles on the business topics of the times. To our commercial men we would particularly recommend the work as well suited to their pursuits and calling; in like manner the general reader will find much to amuse and interest him in its pages. The current number is illustrated with a portrait of Gen. Dearborn.

Shipbuilders' Manual—This is the title of a new work by John W. Griffiths, of this city, Marine Architect and Practical Shipbuilder, and author of the "Theory and Practice of Ship Building." This new work will embrace all that is new and interesting in the art of ship-building. Within the past three years, since the discovery of California, the building of fast-sailing or clipper ships has progressed with as great a rapidity as the peopling of California itself. A new book on ship-building is absolutely necessary now, and Mr. Griffiths has braced himself to the task of producing it. The price of each number is 25 cents. Sold by G. W. Stevenson, 333 Broadway, N. Y.

Ornamental Drawings for Painters and Sculptors—We have received the two first numbers of a new work by Weik & Wieck, Chestnut st., Philadelphia, which we consider of the utmost importance to a very large number of our readers. It comprises a number of sheets published monthly, at 50 cents each set, consisting of four beautifully executed ornaments, drawn by good artists. Ornamental Painters, please pay attention.

Littell's Living Age—This is really the best weekly magazine in the world: It contains a reprint of the best essays and tales of the foreign magazines; they are selected with admirable tact and taste—the very cream of foreign literature. The present number for this week (453) is one of the best we have ever read. It is published in Boston, and is for sale in this city by Dewitt & Davenport.

"Dickens' Household Words and United States Register," Vol. 1, new series. The American reprint of this entertaining journal is now conducted by McElrath & Lord, 17 Spruce st. Ten numbers have been issued of this volume. Terms $2,50 per annum.

The Baptist Preacher—This able monthly periodical, H. Keeling, editor, published at Richmond, Va., contains one of the ablest sermons we ever read on "The Force of Habit," by W. Hooper, D. D., of North Carolina.