

THE ADVOCATE OF INDUSTRY AND ENTERPRISE, AND JOURNAL OF MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME I.

NEW-YORK, THURSDAY, SEPTEMBER 18, 1845.

NUMBER 4.

THE SCIENTIFIC AMERICAN,
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PHILADELPHIA,
(THE PRINCIPAL OFFICE BEING IN NEW YORK.)
By RUFUS PORTER.

Each number will be furnished with from two to five original engravings, many of them elegant, and illustrative of *New Inventions, Scientific Principles, and Curious Works*; and will contain, in addition to the most interesting news of passing events, general notices of the progress of Mechanical and other *Scientific Improvements*; American and Foreign Improvements and Inventions; Catalogues of American Patents; Scientific Essays, illustrative of the principles of the sciences of Mechanics, Chemistry and Architecture; useful information and instruction in various Arts and Trades; Curious Philosophical Experiments; Miscellaneous Intelligence, Music and Poetry.

This paper is especially entitled to the patronage of Mechanics and Manufacturers, being the only paper in America devoted to the interests of those classes; but is particularly useful to farmers, as it will not only apprise them of improvements in agricultural implements, but instruct them in various mechanical trades, and guard them against impositions. As a family newspaper, it will convey more useful intelligence to children and young people, than five times its cost in school instruction. Another important argument in favour of this paper, is, that it will be worth two dollars at the end of the year when the volume is complete, and will probably command that price in cash, if we may judge from the circumstance that old volumes of the *New York Mechanic*, by the same editor, will now command double the original cost.

TERMS.—The "Scientific American" will be furnished to subscribers at \$2.00 per annum, one dollar in advance, and the balance in six months.

Five copies will be sent to one address six months, for four dollars in advance.

Any person procuring two or more subscribers, will be entitled to a commission of 25 cents each.

[From the Boston Courier.]

Ballad of the Alarmed Skipper.

"It was an ancient mariner."

Many a long year ago,
Nantucket skipper had a plan
Of finding out, through 'laying low,'
How near New York their schooners ran.

The custom was to grease the lead,
And then by sounding through the night,
Knowing the soil that stuck, so well,
They always guessed the reckoning right.

A skipper gray, whose eyes were dim,
Could tell, by tasting, just the spot,
And so below he'd 'dowse the glim'—
After, of course, his 'something hot.'

Snug in his berth, at eight o'clock,
This ancient skipper might be found;
No matter how his craft would rock—
He slept,—and skipper slept profound.

The watch on deck, would now and then
Run down and wake him with the lead,
He'd up, and taste, and tell the men
How many miles they went ahead.

One night 'twas Jotham Marden's watch;
A wag was Jo,—the pedlar's son,—
And so he mused, (the wanton wretch,)
'To-night I'll have a grain of fun.'

'We're all a set of stupid fools,
To think the skipper knows by tasting,
What ground he's on,—Nantucket schools
Don't teach such stuff, with all their basting.'

And so he took the well-greased lead,
And rubbed it o'er a box of earth
That stood on deck, (a parsnip bed,)
And then he sought the skipper berth.

'Where are we now, sir? please to taste!'
The skipper yawned, put out his tongue,
Then opened his eyes in wondrous haste,
And then upon the floor he sprung.

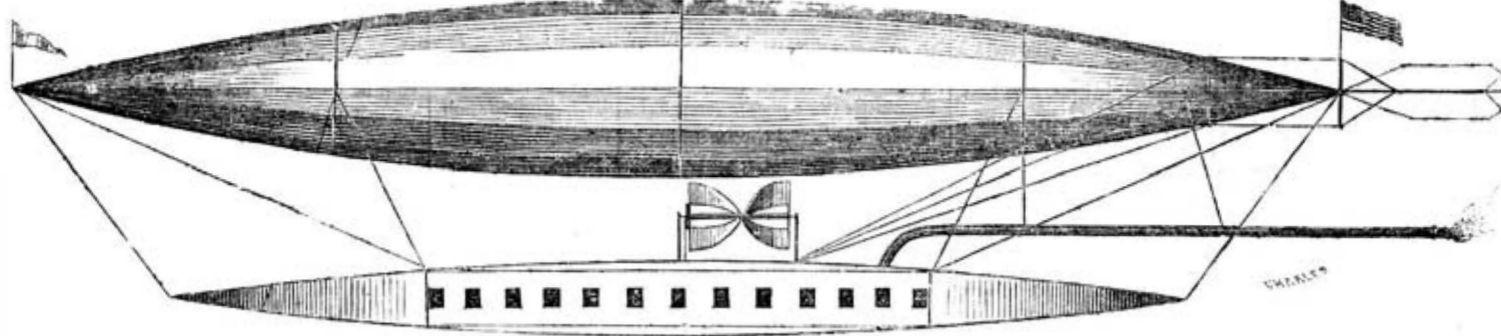
The skipper stormed and tore his hair,
Thrust on his boots and roared to Marden,
'Nantucket's sunk, and here we are
Right over old Marm Hackett's garden.'

A Dandy.

A dandy is a chap that would
Be a young lady if he could,
But as he can't, does all he can
To show that he is not a man.

If wright you would write right,
You should not write it right,
Nor write, nor right; but write it wright
And you will write it right:

THE TRAVELLING BALLOON.



AERIAL NAVIGATION.—The practicability of travelling rapidly and safely through the air, has been already established, as far as theory can establish a point without actual experiment; and the most important principles on which success in this mainly depends, have been already thus established. The specific gravity of hydrogen gas is less than that of atmospheric air, by something more than one ounce per cubic foot; and consequently a cubic foot of this gas being enclosed, has a buoyant power of one ounce in atmospheric air. A hollow globe, five feet in diameter, may be made of oiled silk of less than one pound weight; yet this globe, being filled with hydrogen gas, will possess a buoyancy in atmospheric air of more than four pounds. This sufficiently illustrates the first principles of ballooning; but as it is plain that a spherical balloon cannot be propelled with any considerable velocity on account of atmospheric resistance, we have adopted the elliptic spindle form, which will encounter—as will be proved in our next number,—less than 1/200th part as much resistance as a globe of equal diameter. A balloon of this figure, 350 feet in length and 35 in diameter, being inflated with hydrogen, will have acquired a buoyancy equal to 12,000 pounds. It will require in its construction 16 long rods, extending the entire length, and estimated to weigh 1000 pounds. 2,300 yards of strong linen cloth which, when varnished, will weigh 1000 pounds, thus leaving a balance of buoyancy of 10,000 pounds. An elliptic or revoloidal spindle-shaped saloon is attached to the balloon, being suspended immediately under it by cords or wires. It is covered with cloth, excepting about 100 feet of the central part, which has a permanent floor and is ceiled with thin boards. The weight of this part of the apparatus is estimated at 3,000 lbs. We have already constructed and put in operation a steam engine and boiler capable of working two horse-powers, but weighing only 200 lbs., from which it is estimated that an engine and boiler, of a size to work two horse-powers, may be made within the weight of 1000 lbs. One or two spiral fan-wheels, of 16 feet diameter, together with the requisite machinery for communicating the power of the engine to the fan-wheel; and the requisite ropes and rigging connecting the saloon to the balloon, &c., may all be comprised within the weight of 1000 lbs.: thus leaving a balance of buoyancy of 5,000 lbs. for passengers, baggage, &c. A rudder consisting of two broad fans, intersecting each other at right angles in the centre, is attached to the stern end of the balloon, by a ball and socket, or universal joint. Four arms project in opposite directions from the rudder near its connecting joint; and from the ends of these, small lines extend to the interior of the saloon, and by means of which the direction of the balloon is completely governed, both horizontally and vertically. With regard to the velocity of this aerial ship, it is susceptible of demonstration, and will be shown in a future number, that ten horse-powers is sufficient to balance the atmospheric resistance at a velocity of 100 miles per hour: but if it were otherwise, there is sufficient buoyancy to admit of engines capable of producing 30 horse powers. This balloon being once inflated, is intended to be kept constantly afloat, being moored at about 100 feet distant from the earth, when not in use. When passengers are to be received or landed, the balloon will descend to within a few feet of the ground, and a light-seated car will descend with passengers, to receive them. When passengers are received, a corresponding weight of stone blocks will be deposited, and vice versa. The interior of the balloon will contain an arrangement of lines and pulleys, by which the circumference may be contracted sufficient to cause the balloon to descend whenever occasion requires. These lines, which are attached to the rods, and by which the rods are drawn towards the centre, are operated by a small iron rod or wire, which passes from the interior, down through a small stuffing box, to the saloon. By means of this rod and system, the vertical movement of the balloon will be principally governed. With regard to the safety of this mode of travelling, we think it can be readily made to appear that there will be less danger in travelling over land in aerial vessels, than there now ordinarily exists in travelling by either sailing vessels or steam-boats. In the first place, the balloon will be less liable to accident, than either steam vessels or railroad cars, on account of being less exposed; resting on the elastic atmosphere, and floating with the current, except what forward motion is given it by the propelling machinery, it cannot be effected by gales or squalls, like a stationary object, and its motions must be comparatively gentle. In the second place, the balloon will never soar so high but that in case of accident, or any derangement of the machinery, it may safely descend to the earth, in ten minutes: an idea much more consolatory to the passengers, than that of being five hundred miles from land, and surrounded by a violently raging element, to which, in case of either fire or leakage, the marine passenger must commit himself. A third consideration is, that the balloon will be furnished with an improved parachute for each passenger, and of which each may avail himself in less than one minute, in case of any extraordinary emergency, and thus descend safely to terra firma, much easier than he could paddle himself to shore, on a cotton bale, even from the middle of Long Island Sound. The steam engine by which the balloon is propelled, will be very small, and the boiler being constructed of small copper tubes, there can be no possibility of damage by explosion: and no accident can possibly happen to the balloon, that would cause a sudden descent, so as to prevent the passengers from having sufficient time to avail themselves of the parachutes. Moreover, their baggage would all come to land in due time. We shall give further and more minute particulars on this subject, with sectional illustrations, and mathematical demonstrations; but these must be deferred for future numbers.

MECHANICAL TASTE.—We are often surprised that mechanics do not pay more attention to the art of design—indeed, knowledge of every kind is valuable to them. Sir Richard Arkwright was, we believe, a barber, but having turned his attention to machinery, and getting hold of a hint invented the spinning jenny and amassed a fortune. Wedgwood's pottery came first into notice in consequence of the elegant shapes and designs of his vases, cups, &c. A poor German mechanic rose to wealth in New York city, by being the first to introduce iron railings of beautiful patterns in place of the plain, old-fashioned straight rail pointed at the top. There is a yankee now making his fortune by a cheap process of map colouring which a little chemical knowledge suggested to him. We know a man who has improved the ordinary machine for plating whip-lashes, and applied it to the making stay laces, so that he can manufacture these articles for a price indefinitely below any rival. So, too, in common house-building, the carpenter, in a newly settled district, who understands how to erect a graceful dwelling, will soon carry off the business of those who are contented with the old clumsy style. Who would not prefer a window screen prettily painted to an old fashioned Chinese blind? Yet the one is not dearer than the other. In a word, taste and knowledge, when brought to bear on the mechanic arts, will always carry off the palm from stupidity and ignorance.—*Neal's Saturday Gazette.*

BOOTHERING A WITNESS.—A Little Rock paper tells a story of a youth put upon the witness's stand, who was bothered by the counsel on the opposite sides—one complaining that he could not understand the witness, and the other claiming the protection of the court against such interruptions. Losing all patience, at last, the witness addressed himself to the court—"If you'll just stop 'em both, I'll tell my story so that the biggest fool in the house will understand it all."

A BEAUTIFUL FIGURE.—Life is beautifully compared to a fountain fed by a thousand streams that perish if one be dried. It is a silver cord twisted with a thousand strings that part asunder if one be broken. Frail and thoughtless mortals are surrounded by innumerable dangers, which make it much more strange that they escape so long, than that they almost all perish suddenly at last. We are encompassed with accidents every day to crush the mouldering tenements that we inhabit. The seeds of disease are planted in our constitutions by nature. The earth and the atmosphere whence we draw the breath of our life are impregnated with death—health is made to operate its own destruction! The food that nourishes the body contains the elements of its decay; the soul that animates it by a vivifying fire tends to wear it out by its own action; death lurks in ambush along our paths. Notwithstanding this is the truth, so palpably confirmed by the daily examples before our eyes, how little do we lay it to heart! We see our friends and neighbours perish among us, but how seldom does it occur in our thoughts that our knell shall, perhaps, give the next fruitless warning to the world!

A MAN OF MUCH EXPERIENCE.—A Glasgow paper tells of one Robert Arkless, aged 73, who has been wedded to five wives, and has been the father, up to this time, of 33 children. He has been one of the Church's best customers. Of his children, 29 have died, and of his wives four. This gives 33 funerals. As all his wives are churched for each birth, he has paid for 33 churchings. As all his children up to this time, have been christened, this gives 33 christenings. Having been five times married, he has paid for five weddings! This is a pretty account. A century ago he would have been taken to Court and rewarded as a praiseworthy subject. He is now working for one shilling a day, and his wife for 8d, his master allowing him house and garden.

COMMERCE OF THE UNITED STATES.—The following statement of the commerce of the United States, for the year ending June 30th, 1845, is from the Washington correspondent of the New York Courier. It will be seen from it that the balance of trade is against us to a small amount.

The total value of imports for the year, ending June 30, 1845, is	\$119,512,606
The total value of exports for the year, ending June 30, 1845, is	107,891,622
Excess of imports,	\$11,620,984
The total exports of specie for the year, ending June 30, 1845, is	\$8,477,651
The total imports of specie for the year, ending June 30, 1845, is	3,952,233
Excess of exports of specie,	\$4,525,418

PAPERING CHURCHES.—This is a new fashion, which has grown up lately in Pittsburg, and one that adds much to the interior neatness and beauty of churches. The Fifth Presbyterian church in Pittsburg has been papered with plain granite walls, and a handsome figure paper on the ceiling. The Disciples' Church, in Allegheny, is papered with granite paper on the walls, with marble columns.—The South Carolina Methodist Church, in Allegheny, is covered with marble paper on the walls, with marble columns supporting cornice. The ceiling is covered with white watered paper. The Gazette says paper combines neatness and cheapness, and can be renewed at small expense—not more than double that of whitewashing.

GOOD ADVICE.—Somebody says: The best cure for hard times is to cheat the doctor by being temperate: the lawyer by keeping out of debt: the demagogue by voting for honest men; and poverty by being industrious: but pay the printer if you wish to be happy, and don't want to have the nightmare.

CATALOGUE OF AMERICAN PATENTS
ISSUED IN 1844.

CLASS V.—*Caloric, comprising lamps, fireplaces, grates, furnaces for heating buildings, cooking apparatus, preparation of fuel, &c.*

[Continued.]

- Improvement in the draught of chimneys—Archibald Wieting, Middletown, Pa., Dec. 16th.
 - Method of breaking coal—Joseph Batten, Philadelphia, Pa., Feb. 12th.
 - Fire-fenders—M. Morgan, Jr., New York, July 22nd.
 - Fire-places—Daniel Hemingway, Leesburg, Ky., Nov. 9th.
 - Hot-air furnaces—Jephth Bradley, St. Albans, Vt. June 24th.
 - Improvement in grate-bars of furnaces—John Kymer, Caermarthen, South Wales, Eng., July 19th.
 - Furnaces for heating buildings—George Walker, New Haven, Ct., June 10th.
 - Portable furnaces—George E. Waring, Stamford, Ct., March 16th.
 - Lamp—Henry B. Fernald, Boston, Mass., May 17th.
 - Alcohol lamp for medicated vapour baths—Giles L. Griswold, assignee of L. E. Hicks, Middletown, Ct., March 16th.
 - Lamp-caps—Francis Draper, Esq., Cambridge, Mass., Nov. 20th.
 - Lamp-caps—D. Jarvis and New England Glass Co., assignees of R. M. Eddy, Boston, Mass., May 10th.
 - Improvement in the construction of lamps—Christopher West, Baltimore, Md., Oct. 7th.
 - Lard-lamp—John Tobin, Bloomfield, N.J., March 26th.
 - Light-house lamp—Winslow Lewis, Boston, and Benjamin Hemmenway, Roxbury, Mass., Aug. 7th.
 - Self-supplying lamp—Edwin B. Horn, Boston, Mass., Sept. 11th.
 - Lamp for burning volatile ingredients—Isaiah Jennings, New York, Oct. 12th.
 - Mode of raising lamp-wicks—Samuel Rust, New York, March 9th.
 - Improvement in oil feeders—Joseph Benson, Boston, Mass., Feb. 23th.
 - Cooking-ranges—Herbert H. Stimpson, Boston, Mass., May 17th.
 - Kitchen-ranges—A. W. Thompson, Philadelphia, April 10th.
 - Metallic reflectors—Alonzo Farrar, Boston, Mass., April 4th.
 - Air-heating and cooking stoves—John Wolley, Springfield, Mass., March 16th.
 - Air-tight stoves—John Cline, Norwalk, Ohio, Jan. 6th.
 - Self-regulating air-tight stoves—Harned & Elliott, assignees of Saxton and Elliott, Philadelphia, Oct. 30th.
 - Apparatus for regulating the heat of stoves—Samuel B. Tillman, Seneca Falls, N. Y., April 17th.
 - Improvement in cooking-stoves—James Young and Elmon Parker, Philadelphia, Feb. 12th.
 - Improvement in cooking-stoves—Jordan L. Mott, New York, Feb. 12th.—Simon Pettes, Schenectady, N. Y., Feb. 12th.—S. S. Jones, Philadelphia, Feb. 20th.—Ashley Hotchkiss, Maryland, N. J., Feb. 20th.—Samuel Beutz, Boonsboro', Md., March 9th.—Roswell Bush, Rochester, N. Y., April 4th.—Abner Leland, Milton, Pa., April 4th.—Frederic Kesselmeier, Wooster, Ohio, April 13th.—Peter Mills, Binghamton, New York, April 30th.—Isaac Straub, Cincinnati, Ohio, June 5th.—W. & R. P. Resor, assignees of Thomas Bent, Cincinnati, O., June 5th.—James White, Milton, Pa., June 10th.—Calvin Fulton, Rochester, N. Y., June 10th.—John C. Hermance, Schenectady, N. Y., June 13th.—Henry W. Camp, Oswego, N. Y., June 24th.—James Wager, Troy, N. Y., July 9th.—Lewis James, Amsterdam, N. Y., Sept. 2d.—John W. Riggs, Fort Plain, N. Y., Oct. 30th.—James H. Lyon, Schenectady, N. Y., Nov. 18th.—Adam Ketter, Philadelphia, Pa., Dec. 7th.—Archibald Wieting, Middletown, Pa., Dec. 16th.—William L. Potter, Clifton Park, N. Y., Dec. 19th.
 - Cooking and heating stoves—Laommi Baily, Boston, Mass., March 26th.
 - Railway cooking stoves—Chollar, Jones & Low, assignees of Chollar and Parmelee, West Troy, N. Y., July 11th.
 - Heating apparatus—John Smart, Philadelphia, Pa., March 25th.
 - Apparatus for warming buildings—Benjamin Blaney, Boston, Mass., Sept. 7th.
- CLASS VI.—*Steam and Gas Engines, including Boilers and Furnaces therefor, and parts thereof.*
- Steam-boiler or generating apparatus—Gabriel H. Moreau, France, Jan. 26.
 - Heater of steam-boiler, &c.—Zenas C. Robbins, St. Louis, Mo., Oct. 16.
 - Regulating the supply of water to steam-boiler—Daniel Barum, Bridgeport, Conn., July 24.
 - Furnace of steam-boilers—Leman Bradley, Sharon, Conn., Dec. 12th.
 - Gas-light apparatus—James Crutched, Great Britain, (now in Cincinnati, Ohio)—Eng. July 12th, 1842; U. S. A. May 6th, 1844.
 - Inflammable Gas or vapor engine—Stuart Perry, Newport, N. Y., May 23d.
 - Mode of constructing and governing steam engine, for the purpose of supplying a steam boiler, auxiliary—Henry R. Worthington, New York, July 24th.—reissued Sept. 7th.
 - Condenser and boilers of steam engine—Benjamin Crawford, Allegheny city, Pa., Sept. 7th.
 - Conical balance valves, steam engine—Thomas McDonough, Middletown, Ct., Feb. 12th.
 - Conical seat and steam valves, steam engine—Sprague Barber, New York, April 29th.
 - Locomotive steam engine—Edwin F. Johnson, New York, Dec. 31st.
 - Opening and closing the valves of steam engine—Frederick E. Sickles, New York, Oct. 19th.

[To be continued.]

THE ONE DOLLAR REMITTANCE.—We thank our kind patrons for their promptness: but would remind those few who have received the second number of this paper, but have not yet sent the first dollar according to stipulation, that promptness in this case, is essentially important to us. We trust they will save us the trouble of calling on any one by name.

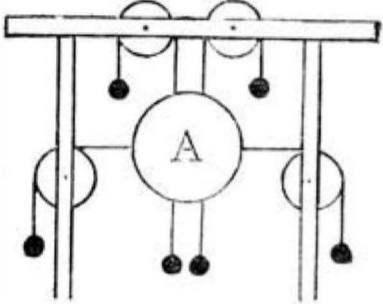
RE-PUBLISHING.—It appears to be the wish of many of our subscribers, who have not had the perusal of the "New York Mechanic," that we should insert in this, some of the most interesting articles from that paper. We trust our former patrons, who have seen those articles before, will not regret their insertion.

SECURE THE FIRST NUMBERS.—We have a few copies of our first number remaining, and those who intend to become subscribers will do well to secure them while they may. There will soon be a pressing demand for them, when too late. We are authorized to offer fifty cents for the first number of the New York Mechanic.

DISAPPOINTMENTS REPEATED.—We may hereafter relate something truly diverting on the subject of the music which we had prepared, and the plate of which we had the promise some three weeks ago. We hardly expected such things in New-York; but have decided to send to Philadelphia for music type, since none can be procured in this city. Our friends shall not often be disappointed on this subject.

POSTMASTERS and others to whom this paper may be sent, are respectfully solicited to exhibit the same to others, that its patronage may be thus extended.

First Principles of Mechanics.



EQUILIBRIUM.—When two or more forces operate on a body in opposite directions so as to counteract or balance each other, they produce what is called equilibrium. If two horses of equal power are harnessed to a reel, or a small slender tree, and draw in opposite directions, the tree will not be bent by the draught. If four horses draw at the same object in the direction of the east, west, north, south, no effect will be thereby produced. The exertion of forces in opposite vertical direction, are equally ineffectual. In the diagram which heads this article, the hoop A, is supposed to be void of weight, or as light as air; but has the forces of the weight of several equal balls drawing in different directions. The consequence is, that the hoop remains unmoved. But let either of the cords which sustain the balls be severed, and the hoop would leave its present position instantly. In this illustration, the only force applied to the hoop is that of gravity. If the hoop was made of iron, and was equal in weight to two of the balls, and the two lower balls were detached, the hoop would still remain unmoved; being then as now represented, in a state of perfect equilibrium. Thus a stone or any other ponderous body, while lying at rest on the surface of the earth, is subject to the action or exertion of the force of gravity in a variety of directions, yet it has no tendency to move in any direction except downward. When a block of wood is gently put into still water, it will descend by the force of gravity, until it has displaced a quantity of water, equal to its own weight. If an inch cube, of any substance whose specific gravity is equal to that of water, be put into a vessel of water containing two square inches of surface, the cube will descend half an inch, and in so doing, it will elevate the surface of the water half an inch, thus bringing the surface of the water to a level with the top of the cube. In this instance it may be readily understood, that by the descent of the cube in the water, an equal quantity and weight of water is elevated a distance equal to that which the cube descends, thus seeking and producing an equality of force. In this instance the water exerts a force termed buoyancy on the cube and directly opposite to that of gravity. In all instances of the action of buoyancy, in which any ponderous body is supported by water, the whole surface of the water, however extensive that surface may be, is elevated: the extent and elevation of this always bears the same proportion to the descent of the floating body, that the area of the floating body does to the whole surface of the water. An interesting instance of equilibrium, may sometimes be seen in a square rigged sailing vessel, directly before the wind, but stemming a strong current. Cases of this kind, may be often seen on the Connecticut River, in which, vessels nearly remain stationary for hours, having a strong current in one direction, and fresh breeze in the opposite, while gravity direct—the weight of the vessel and cargo—tends to sink or depress it, and the force of buoyancy of the water supports or holds it up; thus the vessel is held in perfect equilibrium. We have not supposed it necessary to give any explanation of the nature of the pulleys, over which the cords pass from the hoop to the balls, as represented above; but as the lever, of which the pulley is a modification, constitutes an important item in the science of mechanics, we shall, make that the subject of the Scientific Mechanic in our next number.

The Art of Painting.

(Continued from No. 3.)

Most of these colours can be procured ready ground in oil at the principal paint stores: but it is in general, more convenient for the amateur, to procure the colours in a dry state and grind them himself, especially if small quantities only are required. The ordinary mode of grinding paints is to put a small quantity on a smooth stone, and add a small quantity of linseed oil sufficient to moisten it, and grind by passing another stone, (termed a muller,) over it till it is sufficiently fine for use. In this case a sufficient quantity of oil should be mixed with the paint to render it soft and of convenient consistence to spread readily over the stone, but not so thin as to run off. During this process of grinding, the operator should press on the muller with considerable force, moving the muller in circular or other directions at discretion, as will most effectually reduce the paint to the requisite fineness. When each quantity is sufficiently fine for use, it is removed from the paint stone to the cup or vessel prepared to receive it, by means or a broad but thin and elastic blade, termed a paint-knife. This paint stone, however, with the stone muller, and paint-knife may be dispensed with; and a piece of planed plank, with a block of wood for a muller and a thin blade of wood for a paint-knife, may be conveniently substituted: indeed many of the colours before mentioned, may be simply mixed to the proper consistence with oil, and will answer for common outside painting without grinding. Of this class are Venetian red, yellow ochre (commonly known as "French yellow"), French green, chrome green, Vermillion and lamp black. Paint mills are in general use with those who make a business of painting. When white lead,—which is a principle article in house-painting,—is to be ground in a mill, it is first pulverised by passing a hand roller over it to crush the lumps: it is then mixed with oil in considerable quantity previous to grinding. In this process the operator usually judges of the consistence of the mixture without regard to weight or measure of the ingredients, merely mixing it as stiff as can be conveniently stirred with a stick or spatula; but the usual proportion is three and a half gallons of oil to a hundred pounds of white lead. All other paints are also mixed prior to grinding. For outside painting on bare wood in warm weather, no other ingredient is required than pure linseed oil, with which to mix and dilute the paint. The only rule to be observed in tempering the paint, is to dilute with oil till it will spread freely with the brush. If a new paint brush is to be used it should be of a short smooth kind called *ground brushes*; but no new brush is suitable for common painting, till it has been used two or three days on roofs, brick walls, or other coarse work. It is better for a beginner to procure a half-worn brush if possible: otherwise he may bind the brush with twine for a third part of its length, thus confining the bristles in a compact form till the brush is worn smooth and soft. The brush should in general, be held firmly between the thumb and first finger of the right hand, but passing between the first and second fingers: but in various kinds and positions of work, it is held in a different manner, either in the right or left hand. A painter should be accustomed to work with either hand, with equal dexterity. When the brush is dipped in the paint, it should be drawn lightly across the edge of the *paint-pot* or *bucket*, to remove the redundant paint and prevent its dripping from the brush when filled; or may be gently spat against the inside of the pot, which will answer the same purpose. In painting on wood, the paint should be brushed crosswise and otherwise till it is evenly spread over the work, and then smoothed by being brushed carefully with the grain of the wood. This rule must be particularly observed in painting panel doors: the panels are first smoothed; then the beads round the panels; next the shorter parts of the frame, and last the vertical sides and ridges.

[To be continued.]

New Inventions.

IMPROVED MODE OF TEACHING MUSIC.—A Mr. Jamison, of England, has introduced music printed in different colours, which represent the several tones in the octave, without the use of the five lines staff. The keys of the piano are also coloured to correspond with the book, so that the learner can play off-hand with very little practice. The form of the characters is simple but of diverse lengths, thus indicating the length of the notes to be played. We should think this an excellent plan for facilitating the teaching and learning of music, besides contributing much to the convenience of musicians in general.

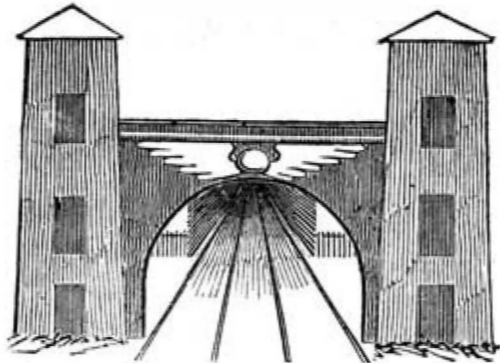
BENTLEYS AND RANDALL'S GENERATORS.—Mr. Gadsby, of the National Hotel, speaks in high terms of this, as a labour and fuel-saving invention. He says he boils five times as much water in one half the time that was required by the ordinary method; and that as he burns only refuse, and otherwise worthless coal, the fuel costs him nothing at all. We have not yet seen the improvement, and of course cannot describe it.

A WAR IMPLEMENT.—Another destructive agent has been invented in Cincinnati. It is a new kind of cannon ball, by which it is asserted one vessel could sink a British fleet of ten sail in as many minutes. As a general rule, however, we think there is little credence to be given to statements concerning new inventions, unless some description is given.

IMPROVED SASH FASTENER.—Mr. Daniel N. Smith of Boston has invented a sash fastener on a new and improved plan, and which is highly spoken of in a Boston paper, although no specification is given. It is said to be more compact and neat in appearance than others, and at the same time more safe. It will when requisite secure the window against being opened without a key even by a person inside.

Another Cotton factory and Carpet factory are about to be constructed at Georgetown, D. C.

Springfield Depot.



We have seen no gate-way in any railroad constructed with so much elegance and good taste as that of the depot at Springfield, Mass. This depot is situated near the bridge, the entrance of which is seen through the archway as shown in the engraving. This building when first seen in the distance, as the passenger approaches from the east, appears like two ordinary gate posts about six feet high, with a gate between; but the traveller is surprised to see these gate-posts increasing in size as he approaches, till, after gliding over two miles of distance, he finds his gate posts to be a pair of towers nearly fifty feet high, and twenty feet square at the base, and occupied as sitting rooms, and business offices of the depot. Over the archway is a commodious dining hall and other apartments for the accommodation of passengers. The bridge over the Connecticut, which is 600 feet wide at this place, is not exceeded by any bridge extant. The western railroad is intersected at this place by the Hartford and Northampton railroads; and when the four trains from the four points meet here with their passengers, a bustling congregation is witnessed, and the instantaneous assemblage from the east, west, north, and south, of people who commingle and associate for a few moments and then as suddenly separate, presents a scene of peculiar interest, and produces a sensation of loneliness in those who remain when the trains have departed.

Re-action of Fluids.

Much has been said and written on the subject of the re-action of steam, water, and other fluids, which has induced us to examine and investigate the principles thereof, which has resulted in the entire conviction that there-action of fluids, which is by many regarded as a frivolous concern, is in fact an important consideration in mechanics; or at least is one which develops important principles, which have hitherto been overlooked, and are still but very imperfectly understood. In a recent article on the subject the writer contends that the re-acting power is uniformly the same, whatever may be the velocity of the wheel from whence the re-acting fluid issues. But if he considers that there is as much power required to overcome the inertia of the fluid in giving it a motion rotarily with the arms of a wheel, as the momentum of said fluid will exert by re-action on the arms, he will perceive that if the arms move with a velocity as great as that by which the fluid issues from the aperture, the fluid will have entirely ceased to operate by re-action on the arms; and as issues from the aperture, will remain nearly motionless. It appears to us that the readiest method of coming at a demonstration of the principle of the re-action of a fluid, is to inquire, first, Why does not the fluid escape from the reservoir more rapidly than it does, when under a pressure, and the aperture is open? To this question there can be but one answer, which is, that a considerable force is required to overcome the inertia of the fluid and put it in motion: and as the square of the force is required to produce double velocity, it follows that as much power is required to give one ounce of steam the velocity of 2000 feet per second, (which is about equal to that of steam issuing from an aperture under a pressure of 100 lbs. per square inch,) as would give 65,500 lbs. a motion of one foot per second. And this is the power that is actually applied by way of re-action, to the arms of a re-acting steam engine, while they are held stationary: but when the arms or wheel is put in motion, the force of re-action is reduced as the square of the velocity. Thus if the motion of the wheel is 1000 feet per second, (which is half of the supposed velocity of the steam,) then the motion of the steam in the contrary direction is reduced to 1000 feet per second, and its force of re-action is consequently reduced to 25 lbs. per square inch, or one fourth part of what it is when the wheel is at rest. The same rule will apply to the action of water on a re-action water wheel. If the water is admitted to the wheel under a pressure of 16 feet head, the force of the re-action on the wheel would be about 7 lbs., per square inch of aperture, while the wheel is at rest; and the velocity of the escaping water would be 32 feet per second. But if the wheel has a motion of 16 feet per second, the re-acting force of the water is reduced to 1 3/4 lbs., per square inch, although the quantity of water used continues the same. If the head of water is but four feet, its velocity will be 16 feet per second, but its re-action less than 1-2 lb. per square inch. And as in this case, the reduction of the motion of the wheel is equal to that of the quantity of water used, it is evident that a much greater quantity of power may be derived from a fluid by re-action, under a high pressure, than under a low; even in proportion to the quantity and fall of water, or of fuel required for the production of steam, as the case may be. With a consideration of the foregoing facts before us, however, in whatever light we view the subject, we invariably arrive at the conclusion, that not more than one fourth part of the full power either of water or of steam, can be derived therefrom by the principle of re-action.

HORRIBLE EXPLOSION IN ENGLAND.—An explosion of the *fordamp*, lately occurred in one of the Durham collieries, by which forty-nine persons were killed. This wanton destruction of human life is, in our view, but little short of wholesale murder. The trifling expense of fifty to one hundred dollars would have been sufficient to have ventilated the mine, and prevented the danger. But labourers are plenty, and the proprietors appear to have but little regard for their lives.

Illustrations of Chemistry.

(Continued from No. 3.)

There are comparatively small portions of mankind, who are aware of the composition of the most common articles in use; and some articles are by those who have given attention to chemistry, supposed to be simple bodies, which are in fact composed of three or more different ingredients. Water, for instance, is composed of oxygen, hydrogen and caloric. Common table salt is composed of chlorine, soda (both corrosive substances) and hydrogen. A common brick is composed of allumine, silex, lime, oxygen and iron; this last ingredient in combination with oxygen, constitutes the red colour of the brick. In the composition of sea-salt all the ingredients are chemically combined; but in that of brick, with the exception of the iron and oxygen, they are merely mixed. The common saleratus is composed of potassium, oxygen and carbon: the potassium being first combined with oxygen, which gives it the form of potash, and becomes afterward united with a combination of carbon and oxygen in the form of carbonic acid. All chemical combinations depend on *chemical affinity*, and this affinity is much greater between some bodies than others, inasmuch that two combined articles may sometimes be readily separated by the presence of a third, whose affinity for one of the first ingredients is greater than that between the two first.

EXPERIMENTS.—Drop a few lumps of saleratus into a glass of acetic acid or vinegar: the oxyde of potassium will unite with the vinegar, while the carbonic acid will be violently driven off in the form of gas.

To a solution of silver in nitric acid, add a solution of common sea salt, (which is called muriate of soda) the nitric acid will let go the silver and unite with the soda, while the muriatic acid of the salt will combine with the silver, forming a white opaque precipitate, which is a muriate of silver.

Mix together one ounce of pure caustic soda, and half an ounce of muriatic acid, (both corrosive substances;) the result will be common table salt.

Into a transparent solution of lime in muriatic acid, pour a transparent solution of saleratus in water: the muriatic acid will combine with the potash, while the carbonic acid will combine with the lime, forming a dense opaque precipitate, which is a carbonate of lime.

In a transparent solution of acetate of lead, (sugar of lead,) suspend a small piece of zinc: the acetic acid will combine with the zinc, and the lead of the solution will be precipitated thereon in metallic form, and branching out curiously in all directions will form a metallic tree. (To be continued.)

DRUNKARDS BEWARE.—When toppers are found drunk in the streets, it is the custom of our humane police, to deposit them in the Tombs, (city prison) for safe keeping, but with little regard to the safety of their lives; and it is not unfrequently the case that the prisoner, when next visited, is found dead. Two instances of this kind have occurred within a few days: and every toper knows, that if after continuing on a spree for several days, if he is suddenly and totally deprived of the use of stimulents, debility, delirium tremens, convulsions and death generally ensue. It is therefore advisable that no person should appear in the streets of the city, while drunk, unless he is prepared to die.

GOING AHEAD OF TIME.—It is reasonably expected that when the extensive western lines of the Magnetic Telegraph are put in operation, intelligence will be communicated westward more rapidly than the apparent motion of the sun; so that if a communication is made from New York at sunrise, it will have arrived at St. Louis, Mo., half an hour at least before sunrise. Hence the Missourians are anticipating the pleasure of reading the speeches in Congress, before they are delivered!

AMERICAN RAILROAD JOURNAL.—This valuable and highly interesting work is published weekly, on large and heavy sheets, in octavo form, at 23 Chambers street, by D. K. Miner. The terms of this paper are \$3 per annum, and decidedly cheap at that. No person in any way concerned in, or connected with railroads, should be content without it. As a "general advertiser of railroads, canals, steamboats, machinery, and mines," it is preferable to any other medium, and as such, should be extensively patronized by all concerned in those branches.

CIVILIZATION AMONG THE INDIANS.—An agricultural meeting was held by the Cherokees on the 16th ult. for the purpose of forming a National Agricultural Society. A variety of valuable premiums were offered for the best specimens of produce and manufactures, among which we observe "a cup worth five dollars for the best beaded belt." Another premium is offered for the best socks. These premiums cannot fail to excite much emulation among the industrious squaws.

LIBERTY.—It is common to hear people oppose the temperance movements, on the plea that they restrict or curtail the liberty for which our fathers fought. On this subject the "razor-strop man" describes the liberty which he enjoyed while temperate, and which may be a fair specimen of the liberty contended for. He says: "My toes had liberty to poke out of my boots: my elbows had liberty to come out of my coat: and I had liberty to lift the crown of my hat and scratch my head without taking my hat off." Who would not contend for liberty?"

LIBERAL NOTICE.—Of the thirty or more flattering notices of this paper, by our generous contemporaries, we present the following from a paper which needs no similar favours,—the Greensborough, (N. C.) Patriot:—

"Scientific American,"—We copy the prospectus of this paper, and take pleasure in saying to our readers that Mr. Porter the editor, is every way competent to the task he has undertaken. We exchanged with him when he published the New-York Mechanic, then one of the raciest and most interesting papers on our exchange list. The mechanics of our vicinity may see the first No. of the Scientific American at our office.



A variety of inscriptions, and other curious antiquities, from ancient NINEVEH, have recently arrived in France, for the Government. They will tend to confirm the authenticity of the scriptures on the subject of that ancient city.

The Falls of St. Anthony, in the Mississippi river, is called by the Indians *Meme-ha-ha*, which signifies "the water that laughs." This is one instance of similarity between the Indian and the English languages.

"What's the news?" is a common question; "Nothing special;" an equally common reply; but this is in bad taste. It is better to have something to report, even if you have to invent a trifle, than oft repeat this thread bars answer.

The fare on the Baltimore and Washington railroad is reduced to \$1 60. The proprietors will have advanced their own interest, and avoid many complaints by this reduction.

Morse's Telegraph is to be laid along the Pennsylvania Canals and Railroads, the use of which has been granted on condition that government orders of public interest will be communicated free of charge.

Judge Sargent, of Philadelphia, has decided that if a man and woman acknowledge themselves to be husband and wife, in the presence of witnesses, they are bound by the laws of matrimony.

The new stereotype process recently invented by Mr. Warren, of Indiana, appears to be a valuable invention, though far short of the extravagant representations of some of the western papers.

Somebody has said, ('somebody' says a great many pert things,) how *civil-eyes-ed* a man looks when you are paying him 'that little bill.' We always think so.

A city paper, in speaking the praises of Miss Delcy, says "hers is the only *hylvish* female voice we have ever heard." That word is similar to one we have heard before.

The Roman Catholic Association for the propagation of their faith, report the appropriation of \$154,200 to their mission in the United States during the last year.

The number of rumshops in Portland, Maine, has been reduced to forty; and the owners of them have been honoured with the appellation of "the forty thieves."

A large spider was lately seen to catch a fish nearly an inch and a half long, from the water, near the city, and convey it safely to the shore. He probably makes a business of it.

Cotton thread has been spun so fine, in India, that one pound of it would reach 115 miles. When woven into cloth, it becomes transparent, by being moistened with water.

To manufacture a single yard of broadcloth by hand, and without the use of machinery of any kind, would require the labour of two men for more than a year.

James Hayward, Esq., having surveyed the route for a railroad between Portland, Me., and Brunswick, reports that he found the route very favourable and easy of construction.

It is reported that a line of magnetic telegraph, between Boston and Lowell, will be constructed in a few days. It is but the commencement of a longer line.

The population of the city of Buffalo is 28,350, having increased 10,000 within the last five years. The increase of business is in proportion, much greater.

A punical writer says that 9,000 pigs have recently arrived at St. Louis, having been lead all the way from Galena. The lead trade is brisk.

There are on hand at the Branch Mint, New Orleans, about \$60,000 in gold, and \$4,700 in silver coins, of which \$3,000 are in dimes and half dimes.

The estimated cost of projected railroads, and other works of enterprise in England, amounts to the enormous sum of 482,335,465 dollars.

Rufus King, Esq., editor of the Albany Daily Advertiser, is about to remove to Milwaukee, and take the editorial charge of the Milwaukee Sentinel.

Of two hundred and three prisoners in the Auburn State Prison, all but one have confessed that they had been addicted to drunkenness.

The receipts at the Patent Office last month, were about \$5,000. The inventive genius of America is wide awake.

The quantity of lead shipped at Galena the present season is expected to reach six millions of pounds. The quantity shipped last year was 43,000,000 lbs.

There are four peers in England whose nett income is nearly \$500,000 per annum each. It must be a hard job to manage so much property.

The great lake of Grenada, in Central America, is 128 feet above the level of the Pacific ocean, and is distant from it only about ten miles.

A stage was recently struck by lightning, about 17 miles west of Chicago, Ill. The driver and one of the horses were killed.

The locomotive "Henry Ruggles," manufactured by Morris, of Philadelphia, lately ran eight miles in eight minutes, on the Long Island railroad.

A razor-strop merchant says that wine vinegar may be very much sharpened by being stirred about with one of his strops.

The Mount Savage Iron Company, of Maryland, have contracted to furnish 2,500 tons of railway iron for the Fall River Railroad.

Most numerous are the inventions lost to the world for ages, and many doubtless to this day, because the inventors, being poor, could not bring them out. To remedy this evil to some extent, the following plan is suggested.

RARE PROJECT.

G. PECK & CO. having, and being offered, several new inventions, worthy to be tested and brought out, present to the public the following liberal offers. One invention promises great usefulness to most cities, villages, and farmers; one, great aid to agriculture. One, greater safety and cheapness to rail-road conveyance; one a great saving of expense, time and toil in education, &c.

They require means to bring them into use. If many will furnish each a little the burden will be light—the success almost certain, and the advantage the greater; and this advantage the inventors will gladly share with the helpers. Incurring much expense, and risking much themselves, it cannot be presuming too much to trust that an intelligent public will see it to be liberal, and wise to risk a little and invest the small sum proposed on the terms here offered.

It is little any can lose if he were to get no return, while we must lose far more, even for advertising, if none accept our offers. But they will have some return, and may much gain. Let then each send us his name and \$2, or 25 cents weekly for ten weeks, and secure the advantages of these inventions.

We add one other consideration. Had Fitch, who first applied steam to propel a boat, and was the real first inventor of steam boats, received a little aid, steam boats would have been in operation more than 50 years ago, and our country would have had the undisputed honor of the invention. But he exhausted his means—none would help—and though he knew it was worth millions, he died in poverty, and our country was the loser for a half century.

WORTHY ATTENTION.

A share or town right of a valuable patent—50 or 100 acres of good farming land; \$2, \$30, or \$85 cash; a copy of the circular interest tables, or a useful Essay, to be had on easy terms.

The patent share will be sent to any one who sends us \$2, or 25 cents weekly for ten weeks, which share will be worth \$5 or more.

The town right will be his who procures 25 share subscribers and sends us the money. The 50 acres his who sends us the money for 150 subscribers within three months. The 100 acres his who sends us for 300 in four months. The \$2 his who sends us the \$2 each for 12 subscribers in 2 months. \$36 his who sends for 180 in 3 months. \$85 his who sends for 250 in 6 months. The interest tables or Essay shall be his who sends us immediately the names of each wagon, carriage, plough or harness maker, of each farmer who keeps bees or silk worms, of owners of furnaces or forges, of each physician, minister, teacher, miller, tanner and merchant of the village or town where he lives, twenty-five names or more; and also a share of the patent right if he sends 25 or more names and 25 cents cash within one month.

The patent share to each of those who pay \$2 within 8 weeks from next September 1, or before, will embrace three inventions; to those who pay in the next 5 weeks, two inventions; and but one to others, and not this unless cash is received in 4 months, unless we choose. The essay or tables will also be his who pays before September 20th. What we desire is speedy work—hence these large premiums. Most important inventions will thus be secured, and a profitable share to each.

We also offer to any one who will send us \$10, \$30, \$75 or \$125, to give him 3, 9, 27 or 54 shares one-third in each of three inventions, or a town right of one, two or three of the patents, and a privilege to sell rights, at great profit; and he may commence at once. We can give good business of this kind now. If our project meets with the favor we expect we shall be able to give a great deal of business of this kind, and thus greatly promote enterprise and industry. We have the best machine to clean wheat of smut, garlic, &c. price \$75. Over 70 have been put in operation in one county in Pennsylvania. We have also the best cultivator for tilling corn and putting in wheat and rye, from \$6 to \$15. Also the neatest, handiest and swiftest straw cutter of its size, for \$12. Office for orders at room 13, 25 Pine street, next to the Custom House.

The inventions will be of different values, and will be put into such number of shares as will make each share worth \$5 or more. We will dispose of the rights, keep the accounts, and pay to share holders the dividends. We shall also from time to time, quarterly or oftener, send them a paper giving them a full account of the inventions, as far as it will be best to publish it. We shall send them the first in September. Let it announce that subscribers are already in to secure the whole project. It will not fail if no more subscribe than we already have. We can do a little, and each who helps will aid us to do more; thus none will lose, but if many help, better will it be to each. One of the most promising inventions will be very costly to start. We want 10,000 subscribers for it; but it will be worth ten times the cost; and it is certain of success, it has been so far tested. The others are very excellent in promise.

The inventions are very important; the land good in this State or in Pennsylvania; the Tables useful, and the Essay on a subject of deep interest to all; and the periodical we shall occasionally send, free of charge, will be of general interest to farmers, mechanics, patentees, physicians, ministers, and owners of minerals, and to all.

It is thus the interest of all to push this project. Let then each improve this offer at once, and have the satisfaction of aiding to bring out great inventions that promise vast benefit to mankind, and good profit to the helpers, as well as timely aid to some worthy inventors, who are struggling with poverty, whom we greatly desire to aid. Now is the word! Now or never. If QUICKLY done, it will be DONE and WELL done, and a GOOD THING done.

It will be easy for two or more to unite, write their names in a letter, put in the money, and direct to G. Peck & Co., New York. The mail will bring it safe, or we will risk it, and pay the postage.

New York, August 1845. G. PECK & CO. Editors who wish notice in this rare project and advertise it, will promote a great public good, and shall share liberally in the advantage they promote. For 13 insertions of the project in full, they shall receive 5 of the three right shares.

Besides the guarantee, which the expense we have already incurred for patents, models, machines, advertising, &c. to make these proposals, gives, to warrant confidence at least to the little extent we ask, we are favored with the following certificate, signed by Hon. R. H. Morris, late mayor and present post-master, and by Hon. F. A. Tallmadge, the present recorder of New York:

"Messrs. G. Peck & Co. wishing the public to favor their business, this certifies, that, from our personal acquaintance we are assured that confidence in their proposals will not be misplaced.

ROBT. H. MORRIS, F. A. TALLMADGE.

"New York, August, 1845." N. B.—We have one invention, well tested, worth \$100,000, the profits of which from this State or Massachusetts will be three times that sum in the next five years. It needs a capital of \$25,000. A half can be had for this sum, one half as capital, and an equal sum to be paid out of the half of the first avails.

All our travelling and city agents will have receipts to give, signed by us. Postmasters, Editors, and others, acting as local agents, in towns and villages where they are known, will give their own receipts, which will be duly acknowledged by G. Peck & Co. au22

DAGUERRETYPE APPARATUS AND MATERIALS.—JOHN ROACH, Optician, No. 82 Nassau-street, New-York, is constantly manufacturing, and has on hand all articles of the best quality used in the Daguerreotype process. Plates, Cases and Chemicals can be had as cheap, if not cheaper, than from any other establishment, all warranted of good quality. Cameras of his own manufacture, as well as French and German ones. Any article or instrument sold will not be represented to be of different manufacture from what it really is. Orders from the country, by express or otherwise, will be punctually attended to. au23

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THE Tool Store, No. 60 Chatham street, corner of Chambers, at the sign of the Saw, Axe, and Plane, will be found good tools suitable, for the following branches of trade.
Blacksmiths' Engravers, Hatters, Shoemakers, Brushmakers, Farriers, Last-makers, Silversmiths, Carpenters, Erranders, Masons, Tanners, Cabinet Makers, Gardeners, Machinists, Tinners, Coach Makers, Glaziers, Millwrights, Upholsters, Carvers, Glovers, Plumbers, Watchmakers, Cooper, Gunsmiths, Saddlers, and Wheelwrights, and Choppers, and Saddle Makers, and Saddlers, which being made expressly to my orders, will be found good, and the Mechanic may place confidence in them. H. R. assures his friends that he has no connection with any other store, and that at his store, State Prison Tools are NOT SOLD OR KEPT. sep 4

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THE subscribers respectfully inform the public that they have completed an exclusive contract with the proprietors of the well-known "Pioneer and Express Line," at Philadelphia, for the daily transportation of Iron Chests to Pittsburg, under their own locks and keys. The arrangement of ADAMS & CO. are such as to insure greater despatch in the forwarding and delivery of valuable packages and papers, at every subscription than has before been offered to the public. The Pioneer and Express line being in perfect order and running through to Pittsburg in three and one-half days from Philadelphia.
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RESPECTFULLY invite those who are in want of a SUMMER HAT, to call at their establishment at 156 BROADWAY, where they have on hand their specially admired CHAMUN PROTECTORS, so light, airy, elastic and beautiful, that OLD SOL, through its agreeable and cooling intervention, is fairly set at defiance.
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