

## New Inventions.

## Machine for Employing the Water-Power of Rivers.

Mr. Joseph Hardie, of Victoria, Texas, has taken measures to secure a patent for new machinery to be submerged in rivers where there is a current, however small, so as to propel machinery on shore by the power of the water. Tidal wheels are old and well known, but very few of them have been employed in our country, and they are not adapted for many of our rivers. What a power there is in the Mississippi river, and yet it flows on to the Gulf of Florida, without applying its giant strength to move—so far as we know—single mill. A machine to apply this power safely and economically is a desideratum: Mr. Hardie has applied his inventive powers to do so. His water motor is submerged, and is connected with a framework on the bank of the river, which can be elevated or lowered by capstan or windlass, according to the height of the river.

## Electro-Magnetic Fire Alarm.

Mr. Henry Van Ausdell, of Eaton, Ohio, writes to us saying he has invented a Burglar's Electro Magnetic Fire Alarm, which is peculiar in a number of particulars. It is of such a nature that any number of houses may be embraced in a circuit, and when one is being injured by fire or entered by burglars, the "alarm" is given at any or all the others, and in such a manner that they can know in a moment the precise point of disturbance; its construction is simple, it consists of a series of two or more circuits (operated by the same battery), one of which is closed by closing doors and windows, which, when broken, releases clock-work, driving a signal wheel operating on the key of the other circuit, &c.

## Improvement in Carriage Springs.

Mr. Gustavus L. Hausknecht, of New Haven, Conn., has made an improvement in springs for carriages by employing a combination of the C and the semi-elliptic springs, positioned transversely with the axle, the lower part of the spring being attached to the axle, and the body of the vehicle is made to rest on the upper part, or inner extremity of the semi-elliptic spring. A flexible band is also attached to the C spring, and made to pass over the top of it. The point of attachment or support of the carriage body, in relation to the combined spring, is asserted to be such as to insure great strength and flexibility. The inventor has applied for a patent.

## Improved Pump.

Mr. Thomas Ling, of Saratoga Springs, N. Y., has taken measures to secure a patent for an improvement in pumps, which is worthy of attention. He employs a water vessel or case named a "Surety Box," situated beneath the plungers, to prevent any leakage of air around the pistons. It is well known that if any air gets under the plungers, the suction, as it is commonly termed, is destroyed, this improvement is to obviate that evil.

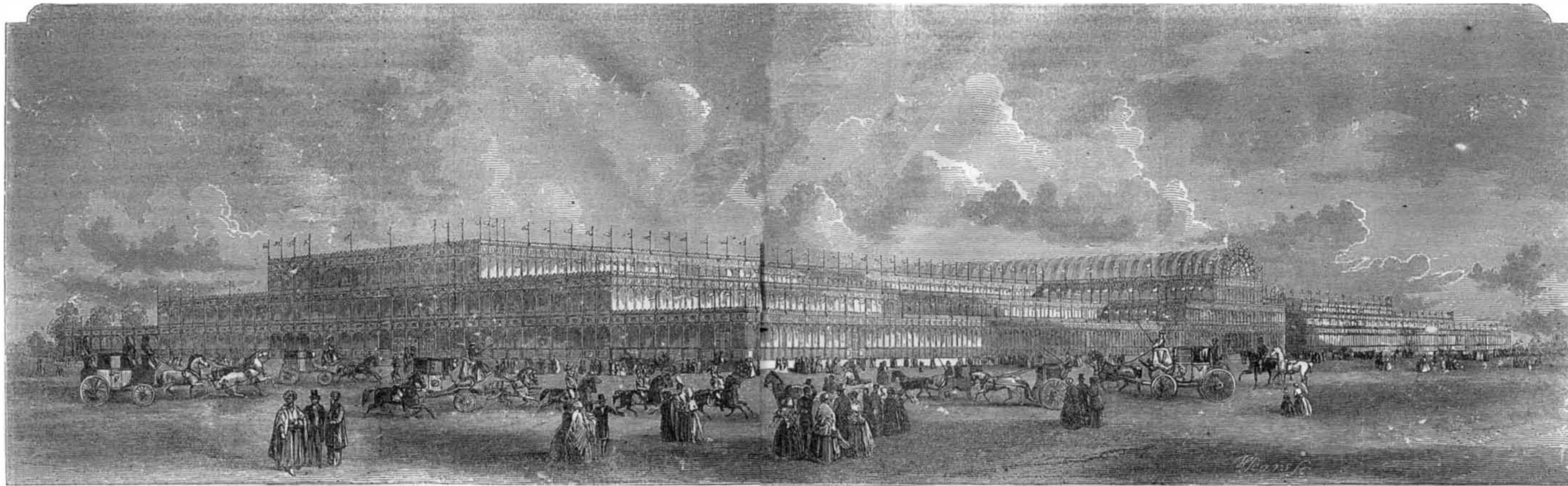
## Machine for Printing Oil Cloth.

Mr. Simeon Savage, at the Lowell Machine Shop, has succeeded in the invention of a machine for printing floor cloth, which promises to be of great utility in the manufacture of this most desirable of floor coverings. We will not attempt any description of the construction of this machine, as no patent has yet been obtained for it, although one will be applied for as soon as a model can be built. This machine is capable of printing 2,000 yards of floor cloth per day, in eight different colors at the same time, and by the same principles, twenty colors could be as readily printed. We saw a specimen of floor cloth printed by it, which warranted us in the belief that more perfect goods can be made by this machine, which is worked by power than can be made by hand.—[Lowell Courier.]

## Gold Hunters.

We see it stated that hundreds of men are leaving the towns of Gardiner, Hallowell, Pittston, &c., in Maine, for the gold mines lately discovered in Somerset county, in that State.

## EXTERIOR VIEW OF THE EXHIBITION BUILDING.



The above engraving is the best view we have yet seen of the Great Exhibition Building, Hyde Park, at least to convey a good idea of its vast extent. We do not intend to say anything about the building itself here, such as its dimensions &c., for by reference to No. 31 all the information required in this respect may be obtained.

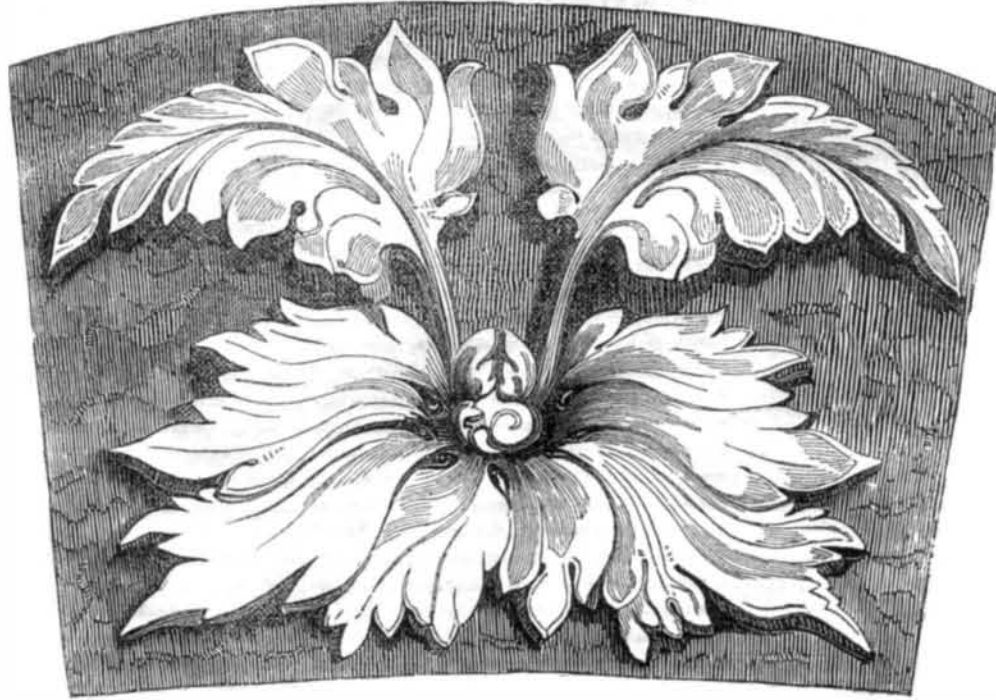
The London correspondence which we have published every week since the beginning of last April, has given our readers a vast amount of information respecting many of the articles, &c., therein exhibited. We will only say a few words about the American department of the exhibition. A very large space was allotted to our country in anticipation of a very great number of exhibitors from the United States. This space is not adequately filled up by the articles which have

been sent there to be exhibited, nor are the articles, the great mass of them, very attractive so far as show is concerned. This has been a fine subject to make a *handle of*, by Jules Janin, the celebrated French letter writer, a royalist wool-dyed and hater of republicanism; it has also furnished a file for the London Times to sharpen its teeth with, but for all this, we neither feel shame, fear, nor melancholy, all will come out right at last. Our commissioner, Mr. Riddle, has written a letter to the Hon. J. C. G. Kennedy informing him that the Queen and Prince Albert had visited the American Department, and had made a careful examination with great apparent satisfaction. Mr. Riddle described the principal articles, and her Majesty took in her hand some of them, although placards at every step informed her that "Visitors are requested not

to touch the goods!" After remaining upwards of an hour in the American section, the Queen expressed to Mr. Riddle the pleasure she had received in her visit.

In agricultural implements, America surpasses all the other nations there, but Great Britain, and stands equal with her. This is gratifying, yes, more, exhilarating, for agriculture is the mother of all arts, and the true thermometer of a nation's solid comforts. Curious visitors, and the journalists who are generally mere literati, without any knowledge of the arts, or machinery, do not appear to take much interest in the American department. The Illustrated London News and the Morning Chronicle are exceptions. The contrast between the plain articles from the United States and the glittering display of other nations is so great, that both critics and visitors make a

## ORNAMENTAL BRICKS.



The accompanying engraving represents a style of ornamental bricks, which has recently been introduced into England, and patented by Messrs. Bowers, Challinors & Wooliscraft, of the Staffordshire Potteries. These bricks, or rather they are a kind of pottery ware, are made from a mixture of clay and other ingredients, calculated to vitrify with the clay. They can be painted and grained with the ut-

most facility, so as to imitate any kind of oak, rose, satin, or other woods, or sculptures in stone, or be gilded without injuring the brilliancy of the gold leaf. They may supply the place of wood carving in architectural decorations, and, from their fire-proof nature, add to the safety of the buildings. Some ornamental bricks were employed in this city about ten years ago; how they came to be disused,

we cannot tell, but we think they are worth reviving, for certainly they appear to us well adapted for ornamental architectural purposes, both inside and out, such as for internal and external decorations of churches, public buildings, mansions, houses, and shops, cornices, mouldings, skirting boards, to match in design any style of architecture, or the taste of any private individual.

hasty survey of our bales of cotton, barrels of flour, and agricultural implements. Occasionally groups of intelligent examiners may be seen standing around some particular article, taking notes and consulting together.

The committee appointed to report on the department of machinery recently made a careful examination of several of our machines; Mr. Brunel, one of the committee, expressed his astonishment that the Americans had not forwarded to the exhibition a greater variety of valuable inventions, as he knew that we possessed a great number. He mentioned particularly that we had neglected to send a model of our Dry Docks, which he acknowledged were not surpassed by any in the world. In the department of machinery, he said that the United States were able to compare favorably with Great Britain; and he expressed a hope

that many of the best machines of our country would yet be sent to the exhibition."

This is true, America is not represented at the great exhibition. We have given our reasons why in No. 37, page 293.

The American carriages at the exhibition are unrivalled for lightness, strength, and simple elegance, this is admitted on all hands. Specimens of rifles, manufactured by Messrs. Robbins & Lawrence, of Vermont, are justly pronounced by Englishmen as among the best, if not the best, of any rifles in the world. The critic of the Chronicle says they are of an unpretending style, but are remarkable for a plain, substantial, and perfect finish; that they are strong, simple, and thorough in their workmanship, and eminently adapted for real service.

Philadelphia lamps and chandeliers compare

favorably with those of other nations. The Morning Chronicle says:—"The casting is remarkable for its fineness, sharpness, and uniformity. The branches formed by arabesque scrolls, profusely ornamented with birds and flowers, delicately sculptured or in bold relief, with centres of richly cut glass, claim particular approval for their elegance and lightness of design. This is among the youngest branches of manufacture in the United States, it being scarcely fifteen years since every chandelier, girandole, mantle lamp, and candelabra used in that country was imported from Europe; and it argues considerable enterprise and perseverance on the part of the manufacturers, that they have attained so much excellence as to be willing to vie in the exhibition with the oldest and most celebrated houses in the world."

## Fire Annihilator.

A great fuss is now being made about a fire annihilator which is to render fire companies useless and lay our firemen on the upper shelf of inglorious repose. Our daily papers have been flaming for a few weeks past with wonderful accounts of its extraordinary powers. One of our contemporaries says "it is an English invention and has been strongly recommended by many principal officers in the Royal Navy and well-informed commanders in the merchant service; and Lord Brougham recently said that he hoped before long no vessel would be allowed to put to sea without having some of these machines on board. It is a little singular that an invention which is said to rank in value with that of the steamboat, the telegraph, the cotton gin, and the railroad, has never been introduced here, if it be as valuable as asserted. It would certainly be immediately adopted, if it were discovered to possess value."

This is sensible, but we see that a G. Q. Colton, writing from New York to the Boston Transcript, gives it a most astonishing character, such a one indeed, as would lead us to suppose that one of the fire annihilators, about the size of a pail, would extinguish a seventy-four gun ship in a twinkling. This fire annihilator is the invention of a Mr. Philips, in London, and was patented by him about three years ago. We noticed it on page 237, Vol. 4, Scientific American. The apparatus is only a device to generate, *choke damp*, (carbonic acid gas) suddenly so as to put out the flame. The principle of the invention is old and well known. It is simply a means whereby some sulphuric acid may be poured upon moist chalk or powdered marble to gene-

rate the gas, and let it get among the flames. It is an apparatus that may be very useful to keep in dwellings, but it never can supercede our fire engines, and in London it has failed to accomplish on a large scale that which it seemed capable of doing on a small scale. It would be very useful on ships, but it has been too highly flattered by far.

## Patents.

During the past year our patent business has increased very rapidly; this is owing to the promptness with which we attended to our business, and the care we exercised to see that it was well done. We take no personal interest in any invention, therefore we have no selfish partiality: everything is strictly confidential—and our motto is "small profits but quick returns." We have lately engaged additional assistance in our draughting department, and are enabled to invite more applicants for patents to consider the advantages we possess in applying for the same. Our experience is of no ordinary consequence, and if inventors take into consideration that a specification, with its drawings, is like a bill—a legal document—they will see that it requires to be carefully drawn up and correctly executed. If a man will have a patent, let it be well done—a good one. Every week patents are surrendered and re-issued at a vast expense, owing to originally bad specifications. It is better to have no patent at all, than one that is defective in any one point. We are very careful in preparing documents so as to meet all future contingencies.

## Tanning Notice.

Next week we shall publish the full specification of "Hibbard's process of tanning."

## Crystal Palace for Sale.

The splendid engraving of the Interior of the Great Exhibition Building, London, measuring 19½ by 13½ inches, and printed in No. 31, present volume of the Scientific American, will be sold at the low price of \$25 upon application at this office.

The above engraving cost, to import, over \$150, and the impressions taken from it have not injured it in the least.

The external appearance of the industrial building represented in this week's number and the best and most correct view published, will also be sold to match the Interior View, price \$15, deliverable on the 1st July.

A correspondent of the Builder has communicated a very simple method of preventing damp walls, by the mere outside application of a lather of soap and hot water, and then, as soon as dry, sprinkling the wall with a saturated solution of alum. He states that he prepared several places in this way, and water poured on the wall ran off as from a duck's back, without producing the least effect.

## Ruttan's System of Ventilation.

In describing Mr. Ruttan's system of ventilation on page 299, we made a mistake in the name. The name of the inventor is Henry Ruttan not John as we had it. In the vicinity of Boston, there is a school, and dwelling house in the course of erection, which are being built to carry out his system; he would like if there was a school house or small dwelling erected in New York to carry out his system; he would be willing to devote his time and personal expenses, the owner merely paying for the workmanship and machinery for warming the air. He could instruct by let-

ter any person how to put up the building until the floors were laid down, when he would come to New York and personally superintend its completion. This is a generous and manly offer, and exhibits the confidence Mr. Ruttan has in the superiority of his invention. The ventilator illustrated on the page referred to, is for burning wood, but it could be made to burn coal just as well by adding a coal grate. One of these apparatus may be seen in Boston, No. 11 Franklin street.

Application for Extensions of Patents.  
U. S. PATENT OFFICE.

On the petition of John and Charles Hanson, of England, praying for an extension of a patent granted to Benjamin Tatham, jr., and H. B. Tatham, as assignees of the said Hansons, on the 29th of March, 1841, for an improvement in making pipes or tubes of lead, for seven years from the expiration of said patent, which takes place on the 31st day of August, 1851. It is ordered that said petition be heard at the Patent Office on Monday, the 18th day of August, 1851, at 12 o'clock, M.; and all persons are notified to appear and show cause why said petition ought not to be granted. Persons opposing the extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

On the petition of Reuben Daniels, of Woodstock, Vermont, praying for the extension of a patent granted to him October 7th, 1837, for an improvement in shearing machines, for seven years from the expiration of said patent, which takes place on the 7th day of October, A. D. 1851. It is ordered that the said petition be heard at the Patent Office on Monday, the 15th day of September, 1851, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition should not be granted. Persons opposing the extensions are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

On the petition of Richard Imlay, of Philadelphia, Pennsylvania, praying for the extension of a patent granted to him on the 21st September, 1837, for an improvement in the mode of supporting bodies of railroad cars, &c., for seven years from the expiration of said patent, which takes place on the 21st September, 1851. It is ordered that the said petition be heard at the Patent Office, on Monday, the 1st day of September, 1851, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition should not be granted. Persons opposing the extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the patent office, which will be furnished on application.

On the petition of John Thomas, of Plainfield, New Jersey, praying for the extension of a patent granted to him on the 26th of December, 1837, for an improvement in drying docks, for seven years from the expiration of said patent, which takes place on the 20th day of December, 1851. It is ordered that the said petition be heard at the Patent Office on Monday the 24th day of November, 1851, at 12 o'clock, M.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted. Persons opposing said extension are required to file in the Patent Office their objections, specifically set forth in writing, at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

THOS. EWANK, Com. of Patents.



Reported expressly for the Scientific American, from the Patent Office Records. Patentees will find it for their interest to have their inventions illustrated in the Scientific American, as it has by far a larger circulation than any other journal of its class in America, and is the only source to which the public are accustomed to refer for the latest improvements. No charge is made except for the execution of the engravings, which belong to the patentee after publication.

#### LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING JUNE 10, 1851.

To Chas. F. Brown, of Warren, R. I., for Balanced Rudder.

I claim the employment, for the purpose of steering ships and other vessels in water, of two rudders, hung upon and at equal distances from the same centre of motion, and with their surfaces parallel, or nearly so, with each other, in such a manner that the same resistance is offered to each by the vessel's motion through the water, and both are balanced substantially as herein described.

[See an engraving of this patent in No. 34, Scientific American.]

To Davis Dutcher, of Springfield, N. Y., for improvement in Churns. Ante-dated Feb. 15, 1851.

I claim the combination and arrangement of the arms (two) with their rollers (two), which are controlled by the crank and the swinging arms (two), with their floats (two) kept in proper place, both in churning and gathering and working the butter, by the resistance of the cream, as herein described and shown.

To T. W. Hill, of Leominster, Mass., for improvement in Comb Cutting Machines.

I do not claim the mere use, in a die of a clearer for forcing out of the die, the article produced thereby, but I claim the combination of the two series of lifters and bent levers *n*, (arranged upon the travelling carriage) with the pressure roller, in such manner, that the continued motion of the carriage, shall operate the lifters after the combs are cut, substantially as described.

To Robert Newell, of New York, N. Y. for improvement in Permutation Safety Locks.

I claim, first, the application of the lever, *b* 5, and dog, *b* 6, with the tusk, 40, to be acted on by the talon, 39, and allow the spring, 38, to throw the tusk, 40, into the notches on the lower part of the followers and auxiliary followers, so as to prevent any portion of these parts, if any of the tumblers are lifted after any end shake motion has been given to the bolt, by any improper attempt to unlock it.

Second, The combination of the tumblers, *A*, slides *B* 1, and follower, *A* 9, through the tenons, 18, notches, 30, tongue, 29, and jaws, 24, to lift the slides, *B* 1, and followers, *A* 9, to the same extent as the tumblers, *A*, and lifted by the key sections on locking the bolt, and to sustain the slides, *B* 1, until the tusk, 34, takes the notches, 31, on the slides, and holds them so that the bolt cannot be retracted until all the tumblers, *A*, are lifted to meet the notches, 30, and allow the springs, 25, levers, *A* 0, and auxiliary followers, *A* 8, to lift and place the followers, *A* 9, in the same position as when the bolt was projected, substantially as described.

Third, the mode described of so arranging and combining the cylinder, *c* 4, by the flanges, *c* 5, angles, 60, tumblers, *c* and *A*, and pins, 47 and 49, with the detector lever, *D*, at the part *c* 1, as that no one of the tumblers, *A*, can be separately lifted without placing the part, *c* 3, of the detector lever over the key hole, with the edges of the notch, 55, covering the open space around the drill pin, 57, by which arrangement no movement of the cylinder, *c* 4, can be made without producing the same effect, so that if powder is introduced into the cylinder, *c* 4, and the cylinder is moved, with the intent of entering a blow-pipe to spread the powder on either side of the cylinder, the part *c* 3 and notch 55 instantly cover the key hole and prevent the entry of the

blow-pipe for such a purpose; these parts being constructed, arranged, and operating substantially as described.

Fourth, the combination of the cylinder, *c* 4, block, 62, and hole, 63, to receive and pass out any gunpowder put in for the purpose of exploding, to destroy the lock, and at the same time, prevent the powder from reaching any other part of the lock.

Fifth, the application of the safety-valve block, 64, to vent the explosion of any gunpowder that may be confined in the cylinder, *c* 4, by plugging both the key hole and the hole 63.

Sixth, The mode of fitting the key hole cover, *c* 3, with the notch, 55, in the detector lever, *D*, to match the neck, 56, on the key shank; such means also preventing the introduction of any pick or false instrument, after any movement has been given to the cylinder, *c* 4, by the notch 55, being as small as the drill pin, 57.

Seventh, the application of the guard-piece, 65, on the detector lever, *D*, to prevent a pick reaching the pin, 45, of the detent dog, *b* 8.

Eighth, the application of the cam pointed piece, *c* 6, on the detector lever, *D*, to move the pin, 47, and detent dog, *b* 8, so attached, that if the key hole cover is cut or drilled off, the piece, *c* 6, falls away and leaves the detent dog, *b* 8, still holding the bolt.

To I. S. Richardson, of Boston, Mass., for improvement in Churns.

I claim, the combination of the rock shaft, levers, connecting rod, and swing for the churn, for the purpose of producing the perpendicular movement of the dasher, substantially in the manner herein described, to be denominated the Oscillating Perpendicular Dash Churn.

To A. C. Arnold, of Norwalk, Conn., for improvement in crossing the fibres in forming the bats for felt, cloth, &c.

I claim, first, the employment, for the purpose of carrying webs, sheets, or layers, of any fibrous material, of an apron of material pervious to air, having a box in which a vacuum is produced placed at the back, the side of the box next the apron being perforated, or otherwise rendered pervious, so that the external air, rushing through the apron to fill the vacuum within the box, forces the material close to the apron and confines it there, in combination with the manner herein described, of throwing off or releasing the material from the apron, by suddenly closing the valve in the pipe communicating between the vacuum box and the apparatus for producing the vacuum, and at the same time opening the valve in the said pipe to admit air into the box; or by any means substantially the same.

Second, the flap operating in the manner and for the purposes substantially as specified.

To G. H. Corliss, of Providence, R. I., for improvement in Governors.

I claim the method, substantially as specified, of steadying the movement of governors or regulators of motion, by apparatus described, or the equivalent thereof.

To Sommers Crowell, of Reading, Pa., for improvement in Railings.

I claim making the dovetailed tenons, whether to the palings, or top and bottom rails, wedge shaped in the length of the railing, the taper at the opposite ends being reverse, and making the grooves in the rails or palings in the same manner, that the palings cannot slide in either direction, binding the whole firmly together, substantially in the manner described.

To Albert Eames, of Springfield, Mass., for improvement in machines for facing and polishing stone and other substances.

I claim the method, substantially as described, of grinding, facing, or polishing the surface of stones and other substances, by means of a grinder, rubber, or polisher, connected and combined with a spindle, from which it derives a rotary motion, by means of universal and sliding joints, substantially as described, that the said grinder, rubber, or polisher, may be carried over any and all parts of the surface to be worked, whilst its surface is self-adapting, as described.

To Wm. Gardner, of New York, N. Y., for improvement in Governors.

I claim the employment of a loose wheel or

pulley propelled by the prime mover, and driving its shaft, through the action of a separate elastic force, weight, or pressure, such as procured by the spring in combination with the several racks and pinions, or their equivalents, as described, for operating the adjusting or regulating slides, substantially in the manner specified and for the purposes set forth.

To C. H. Guard, of Brownville, N. Y., for improvement in Carriage Springs.

I claim connecting the axles of wheeled vehicles, by means of curved spring perches, which are combined with the supporting springs of the vehicle, that have a great degree of curvature than themselves, substantially in the manner and for the purpose set forth.

To John O'Neil, of Xenia, Ohio, for improvement in Washing Machines.

I claim the triple and concentrated action of pressure blocks upon the clothes; being constructed and operated, substantially in the manner described.

To Hugh and James Sangster, of Buffalo, N. Y., for improvement in Lanterns.

We claim the mode of attaching the lamp to the lantern, by means of the springs and flanges, substantially as set forth.

To T. J. Sloan, of New York, N. Y., for improvement in method of finishing the heads of screws.

I claim the method described, of finishing the heads in the manufacture of wood screws, partly shaving the head with a cutter before nicking, and after nicking subjecting it to a second shaving operation, to complete the shaving by means of a cutter, whose edges form with each other a more acute angle than the edges of the cutter first employed, as specified.

To Wm. Van Anden, of Poughkeepsie, N. Y., for improvement in Centrifugal Sugar Drainers.

I claim the contrivance for discharging, and at the same time cleansing the strainer whilst in motion, by means of an elevator rising in a spiral groove, substantially as described, or by an elevator rising in vertical or inclined grooves, which is essentially the same.

To N. T. Allen, of Ludlowville, N. Y., for improvement in Grain Harvesters.

I claim gearing the operating parts of the machine from both the wheels, in combination with the arrangement by which portions may be driven by either so as to equalize the driving power upon each, and thus to allow the machine to be much more easily guided and controlled.

#### DESIGNS.

To S. W. Gibbs, of Albany, N. Y., (assignor to Jagger, Treadwell & Perry), for Design for Stoves.

To W. G. Hallman, of Philadelphia, Pa., for design for Stoves.

To A. Cox, Elias Johnson & D. B. Cox, of Troy, N. Y., for two designs for Stoves.

To J. F. Rathbone, of Albany, N. Y., for design for Stoves.

To David Stuart & Jacob Beesley, of Philadelphia, Pa., (assignor to W. P. Cresson, for design for stoves.

(For the Scientific American.)

#### Practical Remarks on Illuminating Gas.

[Continued from page 310.]

VENTILATION OF GAS LIGHTS.—A few practical remarks upon the ventilation of gas lights may not only be appropriate but acceptable to the reader; its importance cannot be doubted, and yet the subject has commanded but little attention. Much care and attention is paid to the well-lighting of apartments, and far too little is directed to their perfect ventilation. In practice it is well known to be much easier to warm and light apartments, than to properly ventilate them, although the latter may be considered of full as much importance.

Wherever or however light is produced, heat is always evolved. Whether light is obtained from candles, lamps, camphene, gas, or any other organic substance, the elements which supply light are identical in character, although they may differ in their proportional relations to each other. Hydrogen and carbon are the light giving materials, and if a substance is deficient in these two elements, it cannot be used for illuminating purposes; and every substance is resolved into a gaseous state before light and heat are evolved; we have a beautiful illustration before us every evening of the principles of the decomposition of material, its new combinations, and the evo-

lution of carburetted hydrogen gas, in the candle and the lamp, and wherever and however light and heat are produced, whether it be from the pine knot of the backwoodsman or the more unique carcel lamp of the citizen, the same effect is produced. Every candle, every lamp is an illuminating gas apparatus on a small scale; the oil or material to be decomposed, ascends the wick by a capillary attraction through channels formed by fibres of the cotton lying beside each other, and in these channels it becomes heated by the flame to a high temperature and generally is decomposed into an aeriform fluid, which fluid is an illuminating gas. During the combustion, whether the process be effected by oil, gas, or other material, the elements hydrogen and carbon combine chemically with oxygen, supplied to them from the surrounding air; the hydrogen and oxygen produce aqueous vapors (pure water) and the carbon and oxygen produce carbonic acid. In combustion as well as respiration, the effect produced is the same, and the air being deprived of its oxygen, nitrogen is set free, which is as injurious by its negative, as is carbonic acid gas by its positive properties.

The quantities of heat, water, carbonic acid, and nitrogen, resulting from the combustion of any of the materials enumerated, as compared with one another, correspond so closely with the relative quantities of light from each, that the estimate is sufficiently near for practical purposes. Gas yields a brilliant, steady, uniform light; that from candles and lamps is variable. The quantity of light from gas can be increased or diminished as quickly as the wish for it can be expressed. If properly arranged, gas lights illuminate objects in a room from a convenient and agreeable elevation; candles and (portable) lamps are generally placed too near, and in too direct a line with the eye. For these and many other reasons, it is well known that many other persons who use gas accustom themselves to a stronger light than they had been satisfied with from candles or lamps; hence the difficulty in closed apartments of preserving a pure atmosphere and an agreeable temperature. There is no mystery about the matter; each full sized gas-burner yields light and heat equal to that of twelve mould candles of six to the pound. Suppose twelve of such candles to be burning at the same time, and as close together as they could be placed; is it not likely the effects would be soon perceptible? In large and lofty rooms, the heated products ascend towards the ceiling and there remain for a considerable time without materially affecting the lower stratum of air. It is otherwise however in small and low rooms, when the effects of the vitiated air are very rapidly and perceptibly felt.

The identity of the two processes, respiration and combustion, so far as their effects are concerned, cannot escape notice. In both instances air is deprived of oxygen, and heat, water, and carbonic acid are emitted; in the former case, the air which enters the lungs, is retained there for a short period in the act of breathing, and then expelled, materially changed in its character and properties. A portion of the oxygen entirely disappears, combining with vapor of carbon in the air cells, thus forming an equal volume of carbonic gas; the nitrogen is believed to be entirely passive, and to remain unchanged; but when deprived of oxygen it will not sustain life. In the latter case the material to be consumed unites with the oxygen of the air, which is the great supporter of all combustion, and new combinations are formed; the hydrogen unites with the oxygen forming aqueous vapor, and the carbon with the oxygen forming carbonic acid, the same as in respiration. J.B.B.

(To be Continued.)

#### Scarlet Fever.

The Baltimore Sun says that a number of responsible gentlemen have called upon the editor, confirming the truth of perfectly curing scarlet fever by, rubbing the patient three times a day with fat bacon.

#### To Quell Fire.

Muddy water, and dirt also, is better than clean water to put out fire.