Scientific American.

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

VOLUME VIII.] NEW-YORK, OCTOBER 9, 1852. [NUMBER 4.

THE
Scientific American,
CIRCULATION 16,000.
PUBLISHED WEEKLY
At 128 Fulton street, N. Y., (Sun Buildings)
BY MUNN & COMPANY.

Hotchkiss & Co., Boston.
Dexter & Bro., New York City.
Stokes & Bro., Philadelphia.
Cooke & LeCount, San Francisco, Cal.
G. S. Courtenay, Charleston, S. C.
John Carruthers, Savannah, Ga.
M. Boullemet, Mobile, Ala.
J. G. & J. B. Morey, Jackson, Miss.
Sidney Smith, St. Louis, Mo.
M. M. Gardissal & Co., Paris.

Responsible Agents may also be found in all the principal cities and towns in the United States.

Terms—$2 a-year—$1 in advance and the remainder in 6 months.

RAIL-ROAD NEWS.

Locomotive for Plank and Macadamized Roads.

We see it stated in a number of our exchanges that William D. Arnett, of Iowa, has made certain improvements in the locomotive, by which it is adapted to running on plank or Macadamized roads. As far as we can judge, its chief novelty appears to consist in the arrangement of the driving wheels, and in connection therewith a rotating platform, which receives its motion from the driving wheels, and operates in such a manner as, to a considerable extent, increase the speed of the locomotive, by increasing the tractile power of its driving wheels, and also so to operate as to prevent them from cutting or otherwise injuring the road. This locomotive in form resembles those in common use, having a steam boiler, cylinders, and other necessary appendages. It has a steering apparatus of novel construction, by which the pilot can, by the turning of a windlass, give any desired direction to the locomotive in the shortest possible time. The design of this locomotive is to draw any suitable number of conveniently-constructed vehicles, and to connect with a railroad to receive passengers or freight and convey them to distant towns and villages, where it is not only impracticable to construct a railroad, but where travelling and business are not sufficient to support such.

The rotating platform may be an improvement over that of David Gorden, which is described in a work on elemental locomotion by his son Alexander. We think a locomotive engine to draw a number of carriages on a plank road a more sensible plan than to combine carriage, boiler, and engine all in one, but at the same time, it would be easy on any plank road to extend the sleepers four feet, and lay good prepared oak rails on them, and run a locomotive on them; this, for cheapness, would be a preferable plan to that of running a steam engine on the road among farmers' wagons droves of cattle, &c.

The Largest Merchant Ship in the World.

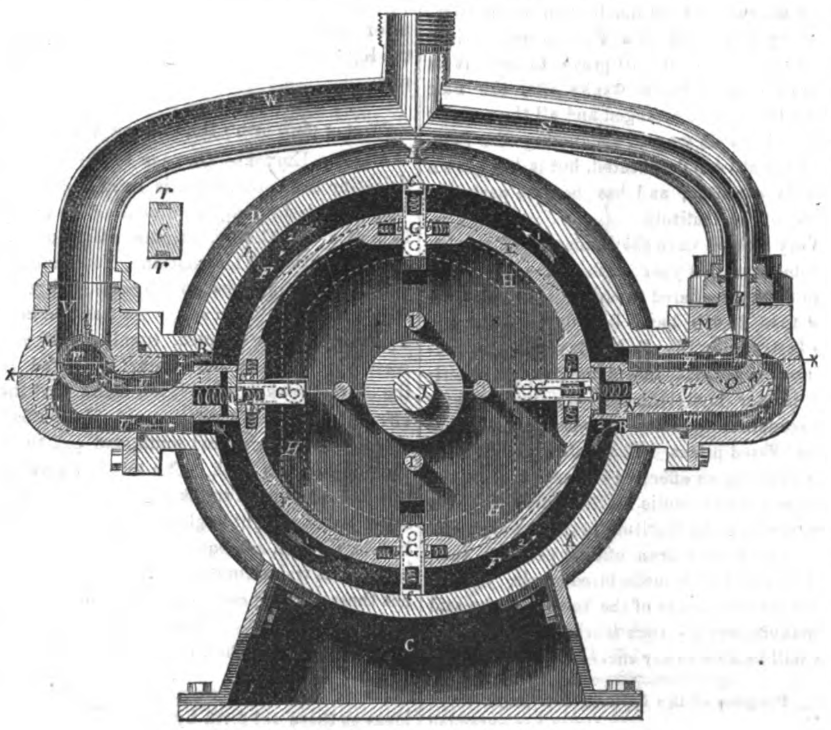
Mr. McKay, of East Boston, is now at work on a clipper ship, which will surpass in size and sharpness, every merchant ship now afloat, or known to be in course of construction. She will be 300 feet long, have 50 feet breadth of beam, 28 feet depth of hold, with three decks, and will register over 3,000 tons. She will be diagonally braced with iron, and built in every particular equal in strength to the best of ocean steamers.

A Secure Lock.

On Saturday the 2nd inst., the Commercial Bank of Albany was closed all day, because they were unable to open the strong room containing the cash, &c. The lock defied all the efforts of the Albanians to open it, and the agent was telegraphed to, in New York, to come up and set matters right.

We have had no equinoctial storms this fall so far. The 22nd of Sept. was a beatiful day. This is another fact for Prof. Loomis.

BARROWS' DOUBLE-ACTING REVERSIBLE ROTARY STEAM ENGINE.---Fig. 1.



The accompanying engravings represent the improved Rotary Steam Engine, invented by Ebenezer Barrows, Esq., of this city, for which Letters Patent have been obtained in all the principal states of Europe, and measures have been taken to secure a patent in this country.

Fig. 1 is a vertical section of the engine, in the lines X X, shown in figs. 2 and 3. Figure 2 is a top view, and fig. 3 a horizontal section in the line X X, shown in fig. 1. Fig. 4 is a perspective view of one of the cylinder abutments and steam heads.

C is a pedestal of cast-iron on which the cylinder rests, forming the whole of the frame of the engine. A is the cylinder, whose inner periphery is turned perfectly true and whose ends are closed by beads, D D, in each of which there is a groove, H H, the form of which is best shown in fig. 1 by dotted lines, being that of a circle with segments cut off on opposite sides, leaving only two-fourths of its circumference. On opposite sides of the cylinder there are openings of quadangular form, from which proceed horizontal flanged pipes, B B. To the inside of the cylinder is fitted a steam wheel, E E, having a groove or channel F (see fig. 1), all round it, extending across so much of it as only to leave sufficient surface for packing closely to the cylinder, being made steam tight by packing rings, *a a*, with springs at the back, (see fig. 3). The ends of the steam wheel are formed of two plates and connected to the ring which forms the channel by bolts, I; and its axle, J, passes through stuffing boxes in the cylinder ends packed with metallic packing, and lined with anti-friction rollers, *i i*. The channel, F, forms the space in which the steam acts, and is divided into two equal parts by abutments, N N, which are cast with the steam heads, and are fitted tight and secured in the pipes, B B, and packed with metallic packing, O, to the bottom, and P, to the sides of the channel, F, (see figs. 1 and 3), the packing pieces, O and P, being dovetailed together as shown in fig. 4, so that P will slide with O, but at the same time slide outwards independently of it as they wear. The steam acts in the passage, F, upon four pistons, G G G' G', which slide through slots in the steam wheel and are packed on their edges by packing pieces, *c*, to the inner periphery of the cylinder, and *d* to the sides of the channel, F, being also packed by strips, *b*, in the slots through which they slide in the cylinder head. All the packing pieces are kept to their work by small helical springs at their back sides. At the back of each piston, on each side, a square stud, *e*, (see fig. 3,) projects through a radial slot, *f*, in the side of the steam wheel, and at the end of each stud is a pivot, *g*, carrying a friction roller, *l*, running in the groove, H, inside the cylinder head. The groove, during the revolution of the wheel caused by the steam acting on the pistons, causes the pistons to be withdrawn into the wheel in order to pass the abutments, N. By the form of the groove it is impossible for more than two pistons to be pushed out at the same time, one in each chamber or division of the channel, F. Only one requiring to be acted upon in each division.

The steam heads or cocks, M M, through which the steam is admitted to the cylinder, and which supply the place of valves, valve-gear, and reversing-gear in ordinary engines, are of peculiar construction, having six ways or passages in each. It has been before stated that the abutments form part of these steam heads. There are conical seats in each to receive the plugs, Q Q, in which are passages to correspond with the ways in the steam heads. The steam pipe, S, and exhaust pipe, W, have each two branches to lead to the two steam heads. Of the six ways or passages in each steam head two, T T', are steam passages leading from the cock seats into the cylinder, the former above and the latter below the abutment, (see the right hand side of fig. 1); V V are exhaust passages leading from the cylinder to the cock seats, the former from above, and the latter from below the abutments, (see the left hand side of fig. 1); one, R, leads from the steam pipe to the cock seat, and the remaining one, V, leads from the cock seat to the exhaust pipe. The section, fig. 1, is taken through the steam passages on the right side, but through the exhaust on the left. The plugs, Q Q, have each three passages, *m, n, o*; the first, *m*, being for the purpose of communication between the steam pipe and either of the passages, T T', and admitting steam to either the upper or lower chamber of the cylinder and the other two, *n, o*, which are in a hollow part of the plug, being for forming a communication between the exhaust pipe and the opposite side of the abutment to that which is in communication with the steam pipe. The two plugs, Q Q, of the cocks are furnished with levers, X X, by which they are turned to admit the steam on either side of the abutment, and allow the escape of the exhaust from the opposite side, and the two levers are connected by a bar, Y, to which is attached a long lever, Y, which will move both cocks at once, in such a way that when the parts are in position for working, whatever relation exists between the several passages in one steam head and cock, the opposite relation will exist between the corresponding passages in the other, as for instance in fig. 1, on the right hand side of the engine the steam passage, T, leading to the upper side of the abutment is supposed to be

Figure 2.

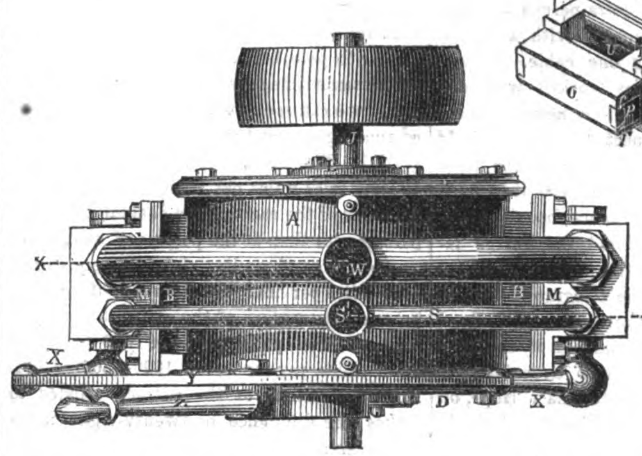


Figure 4.

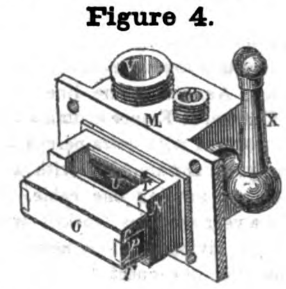
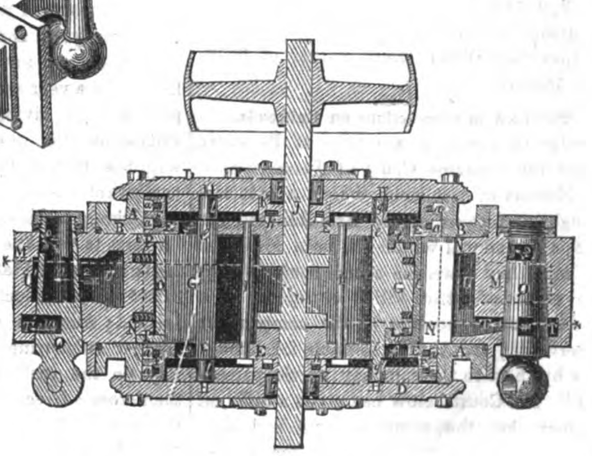


Figure 3.



open to the steam, and the exhaust passage, V', leading from the lower side of the abutment is open to the exhaust pipe, the other steam and exhaust pipes being closed, but in the other steam head, the lower steam and the upper exhaust are supposed to be open.

OPERATION.—The steam always acts on two pistons at a time, continuously, on opposite sides of the axle. The shape of the groove, H, is such that the instant one piston reaches the periphery of the cylinder, and thus fills channel F, and commences to be acted upon by the steam, the piston preceding it commences to be withdrawn, and allows the steam to escape or exhaust from the front of the former. According to the position in which the engine is represented in the engravings, the steam is entering in the direction of the arrows, 1 1, and acting on the pistons, G G, escaping from before them in the direction of the arrows, 2 2, and impelling the steam wheel in the direction of the arrows, the pistons, G' G', being withdrawn towards the axle and passing the abutments. By the time the friction rollers, *l l*, on the studs of the pistons, G G, reach the opposite corners of the grove, H, the rollers of G' G' will have reached the other corners, and the latter pistons will reach the cylinder and come into operation at the precise moment that the former commence to be withdrawn; the steam in front of G' G', and which has previously acted on G G, escaping to the exhaust pipe. The stopping, starting, and reversing of the engine are effected in the simplest possible manner by merely moving the lever, Z, to the right or left, or to an upright position. When the engine is working in the direction shown, the bar is moved to the left, and remains so until it is required to stop, when it is brought to an upright position, and closes all the passages, or, if required to reverse, it is moved to the right.

The manner in which the packing rings of the steam wheel, and the strips of the pistons, are made, is shown in a detached view under the exhaust pipe in fig. 1, which shows a section, the ring or strip, *c*, is of steel, and must fit steam tight, not only to the cylinder but to the sides of the recesses in which they are placed, but as the labor of fitting the steel strips themselves to the recesses would be great, Mr. B. makes small grooves, *r r*, in the sides of the rings and strips, and fits them easily to the recesses in the cylinder and pistons, and then fills the small grooves with soft bearing metal, leaving enough outside to turn true and grind to fit the sides of the recesses; by this much of the labor of fitting is saved. The end and face packings of the pistons are dovetailed together in the same way as those of the abutments, which is an excellent way of keeping them tight at the corners.

This engine is remarkable for its simplicity of construction, and the facility with which its operations may be controlled even by a person totally unconversant with such matters. It is free from complicated mechanism and wears well. Mr. B. has had one in operation for a great portion of the last two years, and says that the packing fits better than when it was first started.

Further information will be furnished by the inventor, Water street, corner of Beekman, this city.

The Law of Obstructions on Railroads.

Judge Gibson, in a case tried at Pittsburg before the Supreme Court of Pennsylvania, on Monday of last week, where a suit was brought to recover of the Erie Railroad the price of an animal which had been killed on the road, laid down the sound doctrine that "an owner of cattle, killed or injured on a railway, has no recourse to the company or its servants; and that he is liable for damage done by them to the company or the passengers." The Court below had given a different judgment, but the common sense and legal knowledge of Judge Gibson put the matter at rest. He says:—"The irresponsibility of a railway company for all but negligence or wanton injury, is a necessity of its creation. A train must make the time necessary to fulfil its engagements with the post-office and the passengers; and it must be allowed to fulfil them at the sacrifice of secondary interests put in its way, else it could not fulfil them at all. The maxim of "salus populi" would be inverted, and the paramount affairs of the public would be postponed to the petty concerns of the individual. Every obstruction of a railway is unlawful, mischievous, and abateable at the cost of the owner of it, without regard to his ignorance or intention. The lives of human beings are not to be weighed in the same scales with the lives of a farmer's or a grazier's stock; and their preservation is not to be left to the care which a man takes of his uncared-for cattle.

The American Institute Fair.

The Twenty-fifth Fair of the American Institute opened at Castle Garden, on last Tuesday, the 5th inst. At the time of going to press we cannot form much of an opinion respecting what kind of a Fair, in comparison with the last one, it will prove to be. It is always two or three weeks after the Fair opens before it is arranged and all the articles received. This way of conducting the Fairs we have always deprecated, but it has grown up into a custom, and has become part and parcel of the Institute.

Very liberal have the Managers of the Institute been this year with prizes. No less than $500 are offered to apprentices; and no less than $3,000 have been offered through the Institute by Mr. F. M. Ray, Esq., as premiums for railroad improvements, as described in our last volume. We will inform our readers in due time about the results of these offered prizes. The Institute offers $100 as a prize for an effective remedy against the ravages of the curculio on the plum. We like this, we give the Institute praise for such prizes. Prizes have been offered year by year, for silk and flax manufactured goods, yet we, in the strictest sense of the term, may be said to manufacture no such fabrics. Next week we will be able to say more upon this subject.

Progress of the Electric Telegraph.

No invention of modern times has extended its influence so rapidly as that of the electric telegraph. It is only eight years since the first electric telegraph line was erected in these United States; that was the one between Baltimore and Washington. At the present time, all the important cities in our country and Canada are united together by 25,000 miles of metallic electric nerves, which from day to day carry the news from east to west, and from north to south. If an important event transpires in any city of our Union this evening, an acount of it is read by the people in the various cities next day. The spread of the telegraph is about as wonderful a thing as the noble invention itself; and its future influence upon all the nations of the earth must be very powerful. In Europe there are no less than 10,000 miles of electric lines; in Hindostan 3,000 miles of wire are soon to be erected, and in a few years more all the ends of the earth will be wooed into the electric telegraph circuit—a far more sensible one than what is termed "a *spiritual* circle." The great success of the submarine telegraph between England and France has directed attention to a submarine line between Europe and America. The line across the English Channel to France contains four copper wires covered with gutta percha wrapped up in spun yarn and shielded with a helical wire tube, all forming one cable. It was laid down a year ago, has worked well, and paid a good dividend. The new proposed submarine line to connect the New World with the Old, is to commence at the most northwardly point of Scotland, run thence to the Orkney Islands, and thence, by short water lines to the Shetland and the Ferroe Islands. From the latter the water line of 200 to 300 miles conducts the telegraph lines to Iceland; from the western coast of Iceland another submarine line conveys it to Kioge Bay on the eastern coast of Greenland; it then crosses Greenland to Juliana's Hope, on the western coast of that continent, in latitude 60 deg. 42 min., and is conducted thence, by a water line of about 500 miles, across Davis's Straits to Byron's Bay, on the coast of Labradore. From this point the line is to be extended to Quebec. The entire length of the line is approximately estimated at 2,500 miles, and the submarine portions of it at from 1,400 to 1,600 miles. The peculiar advantages of the line being divided into several submarine portions is, that if a fracture should at any time occur, the defective part could be very readily discovered and repaired promptly and at a comparatively trifling expense. From the Shetland Islands it is proposed to carry a branch to Bergen, in Norway, connecting it there with a line to Christiana, Stockholm, Gottenburg, and Copenhagen; from Stockholm a line may easily cross the Gulf of Bothnia to St. Petersburgh. The whole expense of this great international work is estimated to cost about $2,500,000. The undertaking is one of great magnitude and will not be entered upon hastily, because the difficulties to be overcome to make it successful and to make it pay, are very great. We hope, however, to receive, before many years pass away, a message on the lightnings' wing direct from Asia or Europe.

Effect of the Earth's Rotation on Locomotion.

MESSRS. EDITORS—On page 11, this volume Scientific American, there is an extract from "Herapath's Journal," commenting on an article of a Mr. Clarke, on the effect of the earth's rotation on locomotion. You have appended a few remarks to the same, and with *them* I disagree. You say, "we can see how a train might be affected, running east and west, but not north and south," as stated in the extract spoken of. Now I think that the effect of the earth's rotation can alone affect trains running north and south, and not those running east and west. The reason I give for this opinion is, that trains running north and south move at right angles to the earth's rotation on its axis, consequently this motion can only affect trains running in this direction and not those running east and west. Yours respectfully, ROBERT ROBERTSON.

New York, Oct. 2nd, 1852.

[It is somewhat singular that the same ideas as those set forth by our correspondent have been reported to us, verbally, by more than one of our readers, who viewed the question in the same light; we soon convinced them of their error. Editors commit mistakes as well as others, but they give subjects, generally, far more solicitous attention than readers, for the reason that all they say is a fair subject of criticism. It is evident that Mr. Robertson has not read the extract from Herapath with due care, for it says, "the difference between the rotative velocity of the surface of the earth at Liverpool and London is twenty-eight miles per hour, and this amount of lateral movement, in proportion to the speed of the engine, will give the engine a tendency to climb the right hand rail in either direction." Now we do say, that if the engine, when running north or south, is affected by the rotation of the earth on its axis, the greater velocity of the earth's surface at London, beside what it has at Liverpool, has nothing to do with the subject at all, for both parallel rails, running north and south, move through space with the same velocity continually. It is different with two rails running east and west, for if one rail were laid around this earth at the equator, and another at the north pole, and a car to be placed on this track, the wheel at the equator would have to move 1017 miles faster per hour than the one at the north pole, to make the circuit of the earth in the same time; this is the reason why we said "we can see how a train *might* be affected running east and west and not north and south." The earth's rotary motion at the equator is 17 miles per minutes; now, as the diameter of the earth at the equator is 1-306th part greater than at the poles, and as the motion of the earth on its axis, at the equator, is 1020 miles per hour, the difference of velocity between the surface of the earth at the equator and the poles is from 1020 to about 3 1-3 miles per hour, for 1020÷306=3·341. How the author of the extract alluded to makes the difference of twenty-eight miles circumferential velocity between London and Liverpool, we cannot divine, it must be an over sight. London and Liverpool are only two degrees apart; now, if there is the difference of 28 miles in every two degrees, it follows that there is 14 miles for every degree (90× 14=1260) or a difference of 1260 miles per hour between the circumferential velocity of the earth at the equator and the poles, a greater velocity, by six miles per minute, than the earth has at the equator altogether. We did not notice this blunder, for we did not stop to reason on all the points; we saw at once that the extract exhibited superficial and erroneous conclusions, and merely alluded to one of them.

In discussing the effect of the earth's rotative velocity on trains running north and south, the laws of gravity and the curvature of the earth must enter into the computation; this is a question involving intricate calculations, the effect, however, must be inappreciable, and as the gravity is greater at the poles than at the equator, the greater surface velocity of one part of the earth more than another, is met by another law and force which should never be overlooked.—[Ed.

New Method of Making Type.

The "New York Sun" says, a working mechanic on Long Island has invented a method of making type without casting, and yet by a process not more expensive. He is to apply it to the manufacture of a fount of steel type for the "Sun." He is acquainted thoroughly with the subject—knows precisely what is wanted and what are the difficulties to be surmounted in producing it. It will require ten or twelve months to test the invention before putting it into actual use, and some time longer than that to produce a full fount of type for the "Sun."

The great objection to steel is its liability to oxidize. It is in this respect not a good material for common printing type, which is generally never dry. Copper is a much better material than steel, taking all things into consideration, and in our opinion, based on the nature of the material—its great affinity for oxygen when moistened—it will be time and money thrown away to make a fount of steel type.

For Hilly Countries—Holdback for Sleds.

On page 404, of last volume, Scientific American, the improved Hold-back for Sleds, invented by Perry Dickson, of Bloomingvalley, Pa., and patented in the month of April last, is illustrated and described. In that description there is one word substituted for another, which destroys the sense and understanding of the application of the improvement as we understood it, and as we understand it now. In looking over that description we see that the word *up* instead of the word *down*, makes the important difference. The improvement is of great importance for going down steep declivities with loaded sleds. We therefore solicit the attention of our farmers again to this useful improvement, one which, we believe, is of great advantage to them. In going down a hill, the tongue of the sled operates two prongs on a lever, which are forced into the ground and act as lever drags to keep the weight of the sled from crowding down upon the team, the heavier the load the more effective are the holdbacks, and they operate effectively just in proportion to the weight of the load and the steepness of the hill. This hold-back has another advantage, viz., if it strikes against a stone or root, it does not catch, but passes over said obstruction and then catches the ground again.

The Duke of Wellington.

This old veteran is dead. He was named the "Iron Duke," and the "Great Captain," the man who never lost a battle." He has at last met a greater Conqueror than Napoleon. There was one thing about the Duke which we admired, he was a great reader of advertisements in papers, and whenever he saw a new patent article advertised for which he had use, he was sure to send for it and give it a trial. Who will say the Duke was a conservative after this? He was a man of progress, always on hand to advance improvements whenever the quality of them was made manifest.

The London Crystal Palace.

The Phœnix London Crystal Palace is going to be the wonder of the world. The owners of it have employed men to arrange and decorate it, who will give it a character. Such men as Owen Jones, Wyatt, &c., will not fail to make it unequalled.

The cholera has disappeared completely from the city of Rochester, in this State; that city, we are sorry to say, has suffered severely.

American Clocks.

It has been our intention, for some weeks past, to speak of American clocks, and to give a few hints about their construction. It is not our object to criticise any make of clocks, nor to say that any one manufacture is better than another, but to point out a defect in a plan of construction which may be improved with no additional cost. The clock trade to our country is of more importance than one would believe unless the statistics were exhibited, it is a source of national wealth, and it materially assists in reducing our foreign debt. The Jerome Manufacturing Co., at New Haven, are finishing six hundred clocks per day, and their auxiliary establishments probably increase the number up to two hundred thousand clocks per year, nearly one half of those are sold by their agency in England; the average price is not far from three dollars, which make a return to this country of three hundred dollars by this establishment. Messrs. Brewster & Brown, of Bristol, Ct., have another agency in London, which is selling about seventy thousand clocks annually, at an average of three dollars and fifty cents, making a total of two hundred and forty-five thousand dollars; there are many minor agencies which probably bring up the amount of money returned to this country to over a million of dollars.

It must not be supposed that the English consume those clocks on the Island of Great Britain, it is not so, but they find their way to all other countries through British agency; and of so much importance has this trade become, that the duties have been reduced to ten per cent., thereby enabling the British shipper to make ventures upon American clocks. The revenue accruing to the crown direct, from the introduction of these clocks, is nearly one hundred and fifty thousand dollars; a further revenue is collected by re-shipment to their colonies and dependencies, in the form of Colonial duties, which may be safely set down at two hundred thousand dollars per year. If, then, the American clock trade be a source of revenue to the English government, and as a matter of policy they have reduced the tariff on American clocks; the same policy will have a tendency to reduce the duties still more, and increase the amount of sales through British agents; it is a fixed fact that we can make clocks cheaper than any other nation on earth, and it is also true that the clock trade is not fully developed, that it has increased from year to year, and is more rapidly increasing than any other branch of American manufacture. It behooves us, then, to look well into the principles upon which we work, and, where practicable, to apply the laws of science in their construction.

An English writer on American clocks says —"The attachment of the pendulum in the American clock was in the worst possible manner." This remark, from an English critic, has led us to look for the truth of the assertion, and we candidly have to admit the fact, according to Reid and other scientific clock makers. They say, that the axis on which the verge moves should be in a line with the point of suspension of the pendulum rod, that the circle of oscillation of the crutch wire and pendulum should be the same, then there would be no sliding up and down of the crutch wire at every motion of the pendulum as in the American clock. Now there must be a cause for this departure from a fixed principle, and we apprehend it must be this,—by looking at any clock we see that the verge reaches over nearly one-third of the crown wheel, this, to a long pendulum, will give a good motion, but to a short pendulum it will give a small motion, and the dealer will at once say "that clock goes too weak," and will select one with a larger motion, the clock maker must suit the public—the pendulum stud is carried down one inch and a-half below the axis of the verge, a large motion is obtained, and the buyer satisfied; still the crutch wire is describing a six-inch circle, while the pendulum rod, at the point of contact, is describing a four-inch circle, hence the sliding up and down of the crutch wire on the rod; this is the objection of the English writer, and it is one that needs some attention. If the public require a large motion to their clocks, it must be so, and the next thing to be considered is, how to attain it with the least detriment to the clock. This may be done in another way—shorten the verge. The leverage can be gained, and the pendulum be brought back to its proper place. It is usual, now, for the verge to reach over eight teeth on the crown wheel, or more; if it only reached over five or six teeth, the motion of the pendulum would be greatly increased, and in this way the unequal power of the main spring would, in a certain ratio be obviated, the escapement would have a greater control over the motive power, and would doubtless prove a better time-keeper.

Another feature in the art of clock making has crept into use within the last three years, which will doubtless give the whole business an impulse that will be felt throughout the world, viz., marine or balance clocks. There is a want of a marine clock for exportation which possesses many qualities; it should be so constructed that it will stand the transportation without damage, one that will wind up easy, run eight days, and strike the hours, start of itself when wound up, at all times, and keep good time. When this is done, the clock trade will expand over countries not now in the use of clocks to any great extent, and a rich return will be made to the United States of America for her time-measuring instruments. This thing is about to be realized, —we were shown an eight-day marine clock made at the factory of the Litchfield Manufacturing Co., all the requisites seem to be combined in this movement, and we doubt not those clocks will find a ready market. The cases are made of papier mache, and are beautifully inlaid with pearl, and seem calculated to fill a place not yet reached by American clocks. The wealthy portion of our countrymen, and of other countries, have purchased largely of the French for parlor use, but we believe this Litchfield clock will, to a certain extent, supersede the French clock. Firstly, it is very ornamental, and has no frail appendage like the glass shade, which is a serious objection, both for transportation and family use. It is also far superior to the French parlor clock, as a time keeper, and in every sense of the term "a better parlor clock." We are glad to see the papier mache applied to this important branch of American art; it is a most beautiful manufacture, and the clocks of the Litchfield (Conn.) Manufacturing Company, which we have seen, make us proud of the artistic skill displayed in their construction and decoration.

How are the Rolling Spheres Regulated?

Messrs. Editors—Having just read an interesting communication on this subject, with some instructive remarks of your own, in your very valuable paper of the 25th inst., I have thought that, perhaps, it might not be altogether uninteresting to at least some of your numerous readers, should you be pleased to insert the following different opinions on this question:—

1st. It is the usually received opinion that "gravity," or "attraction," regulates the planetary motions.

2nd. A correspondent in the "Monthly Friend" says it is "density" and "rarefaction."

3rd J. M. Armstrong, in the "Ladies' Repository," says it is "caloric."

4th. Rev. J. Cummings, in the "Methodist Quarterly Review," says it is "the direct action of the Deity."

5th. The Editors of the "Scientific American" say "that there can be no doubt, as set forth by Mr. Conger, but 'inertia' is the regulator of the material universe, the sustaining law of the rolling spheres."

Abraham Rudisell.

Carlisle, Pa.

[Let us first reply to No. 1.—We do not contradict the statement that gravity is the regulator of the planetary motions. Let us explain the nature of the two, and let every one chose the regulator most suitable to his own ideas. Gravity is that quality of matter by which one body attracts another to it; thus two bodies, like the earth and moon, hold one another at bay, by drawing one another, but gravity has nothing to do with the motion of these bodies, only the direction, such as their circular, eccentric, or eliptical orbits. Such a law as gravity would be unknown if each sphere were placed at a distance beyond the influence of another. Inertia is that quality of matter by which a body preserves its state of rest or motion, without any inherent power to alter the same. When this world received its first impulsive motion, no inherent power could alter it. Day by day, therefore, our globe wheels along in its course with a certain uniformity of velocity. Did this law not exist, it might fleet along at the rate of 1000 miles in one hour and 50,000 miles during the next. This is all we have to say to No. 1.

No. 2.—The correspondent in the "Monthly Friend" having two different strings to his theory, and the one being antipodal to the other, it is perhaps enough to say, that a regulator composed of "density and rarefaction," must be related to the man who wears two faces under one hat.

No. 3.—If caloric is the regulator, then it is a very inconstant one, and the north and south poles must claim to be exempt from its dominion,—there is no variableness at any moment in the operation of the laws of gravity and inertia in any part of our globe.

No. 4.—The Rev. Mr. Cummings surely does not mean, that the Deity does not operate through means of His own ordaining; this may be called "the direct action of the Deity," he should have discriminated, however, between the means ordained by the Creator to accomplish one object, and that which he employs to accomplish another. All organisms are sustained by the direct action of the Deity, but the means he employs to do this, are different from those employed to guide the spheres in their courses; if this were not the case, we could furnish an argument for materialism, which all the clergymen in the world could not overthrow.

No. 5—Being our own, we have no reason to retract a word. If we would compare the universe to a huge clock-work, we would say that Almighty "force" set the wheels in motion, inertia is that quality by which they are retained in motion, and gravity that principle by which they all move in their peculiar directions.

Feeding Farm Horses.

The following is a synopsis of a discussion and statements, respecting the feeding of farm horses, before the "Highland Agricultural Society":—

Mr. Gibson, Woolmet, said—In opening the discussion upon the important subject of Feeding of Farm Horses, I may remark that I have generally found that those horses bred upon the farm are more hardy, easier kept, and less liable to disease than those brought from a distance. In the winter season, young horses ought always to get a due proportion of soft food, and be kept in a roomy place, where they can take the necessary exercise. They ought not to be put to grass too early, and should be prepared gradually for the change, and on no account let them remain at grass too late in the season; they should be carefully and frequently handled, and kindly treated—if this be attended to they will be easily trained to work. When changing their teeth they have difficulty in masticating their food, which should then be soft and nourishing to support them; if at this period they are allowed to get into too low condition, it impoverishes the blood, checks their growth, and renders them more liable to disease at future periods. If it can be avoided, young horses ought not to be put to work before they are three years old, nor carted before they are five, as the better they are treated at this tender age the longer they will wear. The system of feeding I adopt is as follows:—From the middle of October till the end of May my horses get one feed of steamed food, and two feeds of oats daily, with the best oat or wheat straw for fodder. The steamed food used is well-washed Swedish turnips and potatoes, in equal proportions, mixed with sifted wheat chaff. In those years when we had a total loss of potatoes, Swedish turnip alone was used, but not with the same good effects as when mixed with potatoes. At 5 o'clock in the morning each horse gets 6 lbs. weight of bruised oats, at noon the same quantity of oats, and at half-past 7 P. M., 47 lbs. weight of steamed food.

I have acted upon this system for the last fifteen years, having always had from sixteen to twenty horses.—Mr. Binnie, said, from 1st October to 20th May, my horses are fed thrice a-day; the morning and mid-day feeds consist of 7 lbs. of oats and bruised beans each eed (one part of the latter to two of the for mer), the evening feed is composed of 35 lbs. turnips, and 6 lbs barley well boiled together, I only use wheat or oat straw (uncut), as fodder. From 20th May (when, by top-dressing, I have generally cutting grass until 1st July) I allow two feeds of oats and beans, as I have before mentioned, and as much cut grass as satisfies the horse in stable during the day, and turn him to the pasture for the night. From 1st July to 1st October, I find, on an average, that my horses consume, as nearly as I can calculate, a feed of oats each per day. Mr. Steedman, Boghall, said—My horses get in the morning 5 lbs. of oats, along with two or three small Swede turnips (raw), and the same at 12 o'clock, or dinner time; in the morning the boiler is filled with 56 lbs. of turnips, and ½ lb. linseed for each horse; the linseed being difficult to boil, is put into a small bag, and then placed in the middle of the boiler among the turnips; after the turnips and linseed are boiled, they are thrown into a large trough or cooler, and a little wheat chaff along with a handful of salt for each horse; the weight of the turnips being 56 lbs. when put into the boiler, you will find reduced to about 40 lbs., about the half of this is given at dusk, or whenever the horses return from work, and the remainder at 8 o'clock, when the men go to clean and do them up for the night. Under this system, which I have adopted for the last six years, I have found my horses healthy, in good working condition, and always fit for work. Mr. Black, Dalkeith, said—All the farm horses under my charge are allowed 15 lbs. of hay, 12 lbs. of oats, and 28 lbs. of boiled turnips per day, during winter and spring. I consider boiled turnips, when given judiciously to cart horses, a most palatable, nutritious, and gratifying food, particularly to young horses; and not less so to those intended for coach or saddle, than for farm work. Mr. Scott, Craiglockhart, agreed in the statement made by the gentleman who had previously spoken.—Professor Dick remarked that he approved of cooking the food, but the danger lay in giving it in too large quantities at a time. In the evening when the animal's system was somewhat exhausted, and the cooked food was easily swallowed, the stomach became overloaded, and every farmer well knew the consequence. It was most injurious to a horse to allow it to work on for a number of consecutive hours without food. The stomach of the animal was small, consequently could not contain food sufficient to enable it to work a great portion of a day without a renewal of food and rest. In consequence of the structure of the animal, the stomach soon became empty, and when distended, either with food or by the want of it, it was much injured. A combination of hay and oats chiefly would be found the best kind of food—though some thought it expensive—and to cut the hay, and bruise the oats, was much to be recommended. As to pasturing horses, I would say it is a most expensive manner of feeding them, inasmuch as less ground would suffice if the grass was cut green, and given either in stables or yards; secondly, that there is a great waste of manure; and, lastly, but not least, the poor animal is turned adrift to roam about and search for his food with an exhausted system, and is thus deprived of the rest necessary to enable him to perform the requisite labor you extract; and besides, after great exertion, and copious perspiration, with a relaxed system, having every pore in his body open, he is left to seek his bed on the cold and often wet ground, exposed to the elements, and which treatment cannot fail to predispose him to disease, instead of being well groomed—just as important for him as the much-cared-for racer, well littered, and allowed to use what, otherwise, would be an empty stable.

The Great India Rubber Case.

It is reported that the Great India Rubber Case has been stretched to its utmost attenuity, and decided to be drawn out no further. An injunction has been granted in favor of the complainant, Goodyear against Day, by Judge Grier, at Trenton, N. J. The particulars have not yet come into our possession, consequently we cannot say anything more on the subject.

NEW INVENTIONS.

Operating Switches by the Cars.

Edward Van Camp, of Doylestown, Bucks Co., Pa., has taken measures to secure a patent for operating switches on railroads by means of the engine while running on the track. All the points of a switch are turned by means of chains attached to drums, or chain wheels, which are placed below the track with their axes standing up between the rails, the said upper parts of the axes being furnished with levers, segments, or wheels, which are struck by arms protruding below the engine or car, on either side according to the direction in which it is necessary to turn the drums or chain wheels to turn the points of the switch in the required direction. A signal light is also operated upon by gearing in connection with the switch, for the purpose of indicating the direction in which the points of the switch lead, to instruct the person on the train attending to the switches of the proper arm to lower on the engine, so as to let it protrude and strike the segments to shift the switch. This is done at some distance before the train approaches the switch, so that a stationary attendant is not required—all is managed on board of the train.

Excluding Dust from Railroad Cars.

Patrick O'Neil, of Brooklyn, N. Y,, has taken measures to secure a patent for an improvement to exclude dust from railroad cars, which is also applicable to steamboats. A trunk is placed below, above, or at the sides of a railroad car; it has a flaring mouth at each end, and is furnished with valves opening inwards and closing outwards by pressure, for the purpose—while the cars are in motion—of collecting and compressing air, to be used in supplying the interior of the car with pure air, and in producing outward currents for carrying off the impure air from within, and for excluding the dust. It is therefore a dust excluder and ventilator combined.

Improved Switch for Railroads.

R. C. Bird, of New York City, has taken measures to secure a patent for an improvement in railroad switches, which consists in the combination of a stationary curved flanch, and movable grooved flanch so combined and arranged that a car can be shifted from one track to another much easier than by the switch in common use; it is principally designed for city railroads where the cars are drawn by horses, and is not so suitable where the cars are driven at high speed.

Improved Power Loom Shuttle.

John Gledhill, of this city, has taken measures to secure a patent for a useful improvement in power loom shuttles, which consists in a simple mechanical contrivance applied within the shuttle and operated upon by the weft thread in such a way that while the filling continues to be supplied, the protector is acted upon by the shuttle at every stroke, so as to be prevented from stopping the loom, but when the weft brakes or is exhausted, the shuttle will cease to act upon the protector, and the latter throws the loom out of gear—the shuttle indirectly is the stop motion.

Washing and Amalgamating Fine Quartz Gold.

Abiather F. Potter, of Boston, has invented a new and useful method of washing and amalgamating fine quartz gold. The ground quartz dust is introduced at the bottom of a basin containing mercury and forced it between the same, thereby causing the gold to amalgamate with the mercury, and the lighter matter to rise up and pass off by means of a column of water contained in a pipe of sufficient height to overbalance that of the mercury. There is a grooved conical projection secured to the centre of the mercury basin, at the bottom, in which are a suitable number of tangentile grooves or passages which communicate with grooves in the bottom of the basin. The water pipe is placed over the grooves, and the water spreads the ground quartz over and into said grooves, from which it passes in an agitated state to the bottom of the mercury, when the gold amalgamates with the same, and the water and quartz pass off.

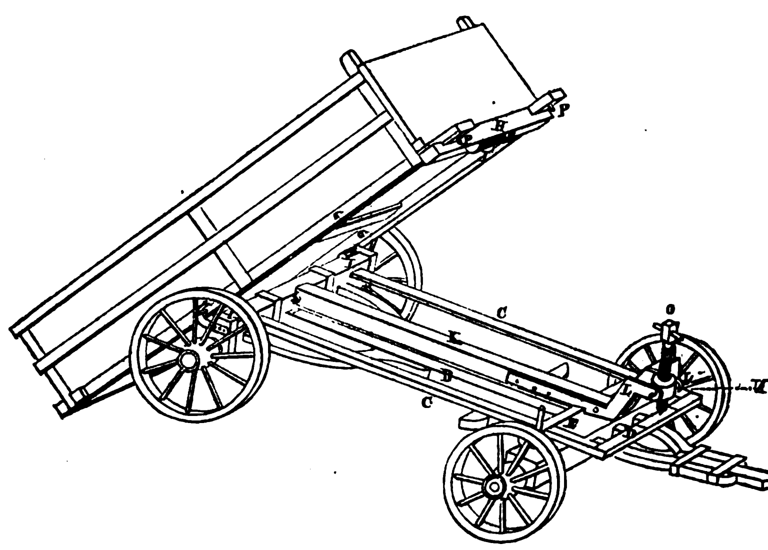
Paper Made from Refuse Leather Scraps.

We have received a piece of paper from W. Boyd, Esq., of Hagerstown, Md., which is made of the refuse leather scrapings from curriers shops. For wrapping paper it is excellent, quite equal in strength to the strong dark brown paper so common in England, which is made from old tarred ropes, and it is much cleaner. We have taken occasion to direct attention on every occasion where we could to improvements on paper making, for we know that it is a manufacture of great importance to our country and the world. This paper made from refuse leather scrapings is manufactured by Mr. Morgan, who resides a few miles from Hagerstown.

Another Method of Ventilating Cars.

J. C. Symmes, of West Troy, N. Y., has invented and taken measures to secure a patent for a method of forcing fresh air into cars and distributing it to the occupants of each seat of the car, as each individual shall desire; as well as furnishing a general supply. Its exit is managed so as to prevent any back draught, and is freed from cinders and smoke before entering the car.

IMPROVED DUMPING WAGON.



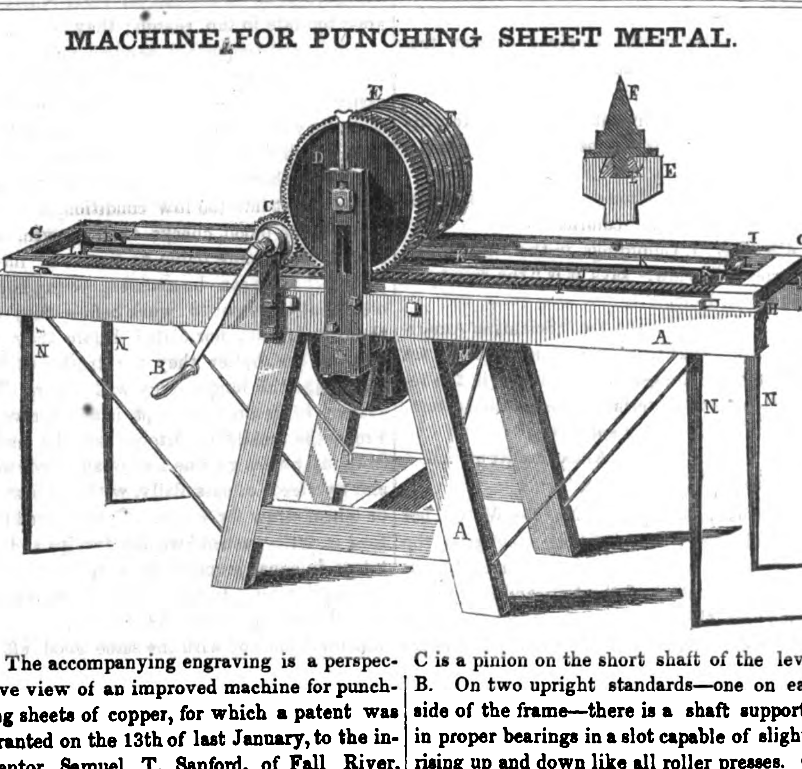
The annexed engraving represents a valuable improvement in Dumping Wagons, patented to A. V. Cross, of Washington City, on the 22nd of June last, The adaptation of this wagon to take the place and as a substitute for carts, in hauling heavy articles, such as brick, coal, &c., will be apparent; the same number of horses being able to draw a larger quantity, and dispense with two-thirds the number of drivers; while, for farming purposes, its value will be appreciated when it is considered the valuable time saved by being able to dump out a wagon load of manure instead of the tedious shovelling heretofore employed; it being adapted to road use, makes it a valuable acquisition to farmers.

The construction is so simple as to require but a slight description: between the sills or bottom rails of the body is framed at the front a cross-piece, H, this carries an iron roller, I'; there are two similar rollers, I I, let partially into the bolster of the hind axle; B is the ordinary perch; C C side framing connecting the ends of the bolsters, and extended in front and united with a cross-piece, D, upon which the point of the elevating screw acts. K L is an adjustable incline, which, when the load is to be dumped, is elevated by the screw, O, which, raising the incline, brings it in contact with the roller, I', on H clearing the pins, P P, from the front bolster, E, and the load descends the incline, being facilitated by the rollers, I I, upon which the body at all time bears. The body descends until it reaches a hook, which may be noticed between the hind wheels, when it tilts up and delivers its load. The body being again run up on the incline, the screw is turned and the body rests on the front bolster as an ordinary wagon; it is therefore very convenient in all its operations.

The great merit of this invention is in its simplicity, being freed from the complex contrivances that heretofore have rendered wagons of this character liable to accident, and should one occur an ordinary mechanic may repair it.

More information as to the purchase of State or county rights, may be obtained of the sole agent of the patentee, John F. Clark, Washington City.

MACHINE FOR PUNCHING SHEET METAL.



The accompanying engraving is a perspective view of an improved machine for punching sheets of copper, for which a patent was granted on the 13th of last January, to the inventor Samuel T. Sanford, of Fall River, Mass.

A A represents the frame, which is well braced, and has end legs, N N. B is a crank handle to drive the punching rollers, and move the sliding bed with the sheet of copper on it. C is a pinion on the short shaft of the lever, B. On two upright standards—one on each side of the frame—there is a shaft supported in proper bearings in a slot capable of slightly rising up and down like all roller presses. On this shart are keyed a series of metal rollers or wheels with washers between them. There is a cog wheel, D, on each side (one only shown) secured on the shaft with the rollers; these cog-wheels mesh into racks, I I, one on each side, and move the bed along with the sheet of copper under the punching rollers. E represents the drum of punching rollers, and F the punches projecting from the peripheries of the rollers. A transverse enlarged section of a punching roller is shown above the bench; F is the punch, its shank is a screw; E' is a nut inserted sideways in a roller, E; the punch is therefore easily screwed into the nut, and the nut easily inserted in the roller. G is the bench or table on the top of the frame; it is made to slide on ways, H H, from one end of the frame to the other—backwards and forwards. On this bench or table are the two racks, I I; there are also two side bearers, J J, and two narrow supporting leaves, K K, one on each side of the bench. K' is as mall roller; there are four of them, one on each side of the frame, behind and before the punching rollers, but only one can be seen through the centre space of the table. These leaves, one for each end of the table—are hinged on the side bearers or pieces, J J, and are for sustaining and carrying a sheet of copper each under the punching rollers. When the sheet of copper is punched, the curved knobs, L L, on the ends of the leaves drop inside of the rollers, K', and the leaves, K K, drop like the wings of a table, leaving open the space in the middle of the table, and the sheet of copper then at once drops square and flat on the floor below. Below the table is a drum, M; it is made with grooves in its periphery; into these grooves the punches, F, project, when they pass through the sheet of copper. This drum, M, therefore, is a rotary bed for supporting the sheets of copper and receiving the pressure; it is a most excellent device for this purpose. The sheets of metal are laid upon the leaves, K K, and the turning of the cog wheel, D, draws forward the rack table with the sheet of copper on it, under the punching rollers, where the sheet is punched, and then drops down on the floor, as has been explained. By reversing the motion of the handle, B, another sheet of copper is punched, while the sliding table is being moved in the other direction; the machine works both ways, and therefore it saves a great deal of time. It will be observed that it can easily be adjusted to punch any number of rows or holes in a row. These holes can be made of a diamond, square, round, or any form, by having the punches of different forms. It can also make any sized holes, by raising the shaft of the punching rollers.

This machine punches the sheets and leaves them as smooth as when taken from the boxes; the holes are all punched true and of equal size, and 1500 sheets of copper, punched by one person, is considered a day's work in New Bedford, Mass., where it is in operation at the shop of Loyd N. Pierce. It is also to be seen in operation at No. 118 Avenue D, New York city, and its merits have been highly praised by all those who have seen it operate, and who have used the sheets punched by it.

More information may be obtained by letter addressed to Mr. Sanford, at Fall River.

Hydraulic Rams.

J. C. Strode requests us to say that he has not finished the Ram at New Brunswick, only so far as to render it useful to the company until winter, when the Ram will not be wanted; he says he can make the ram throw up more water than it is capable of throwing up now, and greatly insure the durability of the outlet valve; he says it will be very expensive to the company to keep it in valves as it is now operating. He has explained to us the principles with which a ram should be made to operate to throw up the most water.

Cutting Telegraph Wires.

About the middle of last month, Moses Knight was found guilty in the court at Marlboro District, S. C., of cutting telegraph wires, and he was sentenced to receive 39 lashes on the back. If the event had occurred in New York, the criminal would have been suffered to go upon bail, and that would be the end of it.

The Voltaic Lemon.

We see that some of our cotemporaries have quoted the description of the voltaic lemon from the Scientific American without our comments. We do not believe the lemon voltaic battery is of the least use for practical purposes.

Scientific American

NEW-YORK, OCTOBER 9, 1852.

The Rulers of the Sea.

It is a most singular fact, that the two great-est naval powers in the world, Britain and the United States, have recently had develope-ments of gold within their dominions, which far surpass those of all the other nations in the world put together. And it is not a little singular, too, that although these two are the greatest naval powers in the world, that their very fields of discovery have come up to stimulate, to improve, develope, and extend their nautical genius and resources to a pitch far beyond that of which we can have any conception at present. At one time the Spanish fleet was gigantic in comparison with that of England; after that the Dutch rode masters of the seas; but at length England swept them all down with the thrusts of her trident. Paul Jones taught us how to meet and defeat England upon her own seas, and since the last war especially, our people have felt a confidence in their nautical genius, which has gone on, and side by side with England, has met her, and matched her in the struggle for supremacy as rulers of the seas. The tonnage of the English navy far surpasses ours as yet, and may do so for a great number of years, as her gold discoveries and the vast extent and resources of her colonies present the means of stimulating her nautical spirit to an indefinite extent. But when we take into consideration what we have done in the few short years of our national existence, we can truly say that, for efficiency and completeness, the American mercantile marine is "The Ruler of the Seas." The finest sailing ships, and steamships too, between Liverpool and New York, are American built; and the swiftest and finest vessels which run between China and London, are also American-built craft. The Commodore of the New York Yacht Club challenged all the yachts in England to sail with him in a race for £10,000, and could not find one to take him up. An American company, in Boston, recently challenged all the ship-builders in Britain for £10,000 to produce a ship from 800 to 1200 tons register, to run from a port in England to one in China, and back, and, as yet, the challenge remains unanswered. Does not this show who are the rulers of the waves? It is an admitted fact that the Americans have been in the habit of building faster and finer sailing vessels than the English; now, how is this to be accounted for, as England has long prided herself in her navy, and has expended more money on nautical improvements than any other nation? There must be a reason for it. Ship-building has hitherto been, as it were, altogether a practical art, and between the American and English systems there has been a great difference. In the English dock-yards the ships have been built from drawings based upon what were considered practical data and established facts; the Americans have selected the *model* as the basis of their operations, and from these two fundamental customs, we see the results, in the superiority of the one over the other. It is true Sir Isaac Newton, in his "Principia," laid down the form of least resistance, and said it would be useful in the art of ship-building; yet, up to 1834, no true theory or science of the correct form for ships, was publicly acknowledged in England. In that year "The British Association for the Advancement of Science," commenced making experiments, and from more than a hundred models of different sizes, a theory was laid down by the Experimenter J. Scott Russell, called the "Wave Line." The principle of this is, that the external form of a vessel should have a resemblance to the section of a wave, and the originator of this theory claims that the fast American ships are built upon it. This theory, then, was known and practiced in America before it was discovered in England, but still it shows that, in England, they have not confidence in it, or why not accept the American challenge.

At the present moment, it is somewhat singular that North Britain maintains the only reputation Britain has for fine sailing vessels and steamships. The fast ships which sail from London to China, in competition with the Americans, and which nearly rival them, are built in Aberdeen, and the steamships of the Cunard line are built on the river Clyde. In point of speed, however, they are a little behind us yet, but with the vast Australian trade just opened up for England, and our great trade to the Pacific shores, it is not easy to predict what the power and speed, of both navies may amount to in a few years; but until a British yacht beats all ours in American waters, and until the American ship challenge is accepted, and the challengers beaten, it is no more than just to claim for the challengers the title of "Rulers of the Seas." We have thrown out these remarks, not for any boastful purpose; the struggle for such a title between the people of the two countries is a peaceful, noble, and manly one, and that country which generates and adopts the greatest number of improvements, will surely carry off the prize.

The Philadelphia Mint—Refining Gold with Zinc—Its Troubles and Trials.

On the 24th of September, 1850, two patents were issued by our Patent Office, to two distinguished American chemists, for two different processes for the refining of gold. The names of the two patentees are Prof. J. C. Booth, of Philadelphia, and Prof. R. S. McCulloh, of Princeton, N. J. The specification of Mr. Booth's patent was published on pages 59 and 67, Vol. 6, Scientific American. Prof. Booth is the author of some good works on chemistry, and was Editor of the Encyclopedia of Chemistry, in which the profound article on Electricity was furnished by Prof. McCulloh. It would appear that, at one time these two gentlemen were good friends, at present they appear to be the very reverse, and this has been caused by circumstances and actions connected with their separate patented processes for refining gold. Prof. Booth is the present Melter and Refiner at the Mint, in Philadelphia; Prof. McCulloh held the same office from 1846 to 1850. It seems that he has preferred charges against Prof. Booth, who, it is stated, attends to his private business of manufacturing chemicals, as well as retaining his office at the Mint, and this with the full understanding of the Director of the Mint. At one time these two gentlemen assigned to one another—as a fair exchange—the one half of each of their patents. Prof. McCulloh says the patent of Prof. Booth proved worthless to him, and so he threw up his assignment and took back the half of his own.

As we have published the patent of Prof. Booth, we need not describe it again, but as that of Prof. McCulloh is unknown to the public, an account of his process will, no doubt be interesting to our readers. The method of refining gold, heretofore practiced, has been to melt the gold along with two-thirds of its weight of silver, run it into cold water to granulate, and then separate the two metals by strong nitric acid, the silver being taken up by the acid, after which the silver is recovered by zinc. This process involves a very large amount of silver removed from circulation, it being retained for nothing but refining the gold. The invention of Prof. McCulloh consists in using zinc instead of silver, thus allowing the $200,000 of silver to be used in the currency circulation, which is now employed for refining. The separation of the zinc from the granulated gold is accomplished with sulphuric acid, and the silver which may be combined with the gold is separated first with weak and then with strong nitric acid. The gold, after this, is washed, melted in crucibles, toughened, rolled, and coined. Some experiments were first made by this process in the Mint, but not under the superintendence of the patentee; they were not quite successful, owing, perhaps, to a want of care. After this, Prof. McCulloh asked for and received authority from Washington to test his process at the Philadelphia Mint, and in the early part of 1852 he refined 14,089·07 ounces of bullion, for which purpose there were employed 2,260 lbs. of zinc, 6,245 lbs., of sulphuric acid, and 1873 lbs. ot nitric acid, costing $348,75. The gold produced was excellent; the process is much quicker, and certainly much cheaper than the old way. It would appear, however, that there is either a prejudice, or something else, against this process, by some of those in the Mint at Philadelphia; although Professor Booth has stated that it is the best which could be adopted.

It seems there is sometimes a great waste of silver in the Mint, when, from some cause, it is not well separated from the gold. From the 31st of Dec., 1849, to June 30th, 1851, it is stated that there were $139,856·02 (120,188·773 ounces of silver) lost to depositors and the country, because the California gold was not duly subjected to the parting process for the separation of the silver. This may account for those reports which have come from abroad, about American inferior gold coins, California gold contains from 11 to 12 per cent. of silver, and depositors are charged 2 per cent. of silver alloy for gold coins. There is not so much alloy as this used, so the wastage is thereby covered up. It seems that it is the custom to sequester all sums of deposits of silver and gold, when the amount of either, contained in any deposit of the other, is less than five dollars. If Prot. McCulloh's invention is so much superior in every respect to the old process, it is certainly not only the height of folly, but blank stupidity, not to adopt it, and that it is superior, he has furnished very good proof in the statements of those who assisted him in his experiments in the U. S. Mint. With the great scarcity of silver coin, we want all we can get to circulate, and if zinc not only answers as well, but a better purpose in refining gold, what in the name of common sense is the reason his improved process is not employed in the Mint? This is a grave and important question; with the great amounts of California gold received weekly at the Mint, the quickest, cheapest, and best mode of refining that gold, is just so much ot a saving to our country. If, in one year and a half, 120,188·773 ounces of silver have been lost to the country and depositors, because of inefficient separations in the Philadelphia Mint, how much will be lost to the country in the course of ten years? This loss of silver is appalling; it should not be—it surely need not be.

Aerial Navigation—A New Old Plan.

A correspondent of the "New York Daily Times," ot the 30th ult., signing himself G., writes a long article on what he endeavors to make appear to be a new invention for navigating the atmosphere. Of science he knows a little, but there is a great deal he knows nothing about. Ot what has been done in ballooning he knows a little, but there is also a great deal he knows nothing about, especially in our New York experience. He beseeches his readers to disabuse their mind of all preconceived notions about ballooning, for "a balloon is not a ship, water is not air." Who, among his readers ever thought or said differently. He assures them that the difference between a balloon and a ship consists in this, the latter always sails in one plane, while the balloon proceeds at any angle of direction. He means by this, that the balloon can rise and fall, and who does not know this. He theoretically explains his whole system of navigating the air upon two principles, one to make the balloon traverse any angle on a plane, on the principle of the boomerang of the Australian savage; and the other to traverse any vertical angle by increasing or diminishing the heat. His plan is to raise his balloon by heated air like Montgolfier, and to heat it with a stove in which spirits will be burned. His balloon is to be a silken cylinder coned at the ends, and on either side are to be silken wings. He considers the heated air to be safer than hydrogen, which he calls an explosive gas (a mistake, however) and he considers the cylinder form of his air bag better than the globular form.

Nothing is to hinder him from landing at any point, and we have the old story of taking in a proper supply of fuel, and starting from New York for San Francisco, with the same certainty as a packet tor Liverpool.

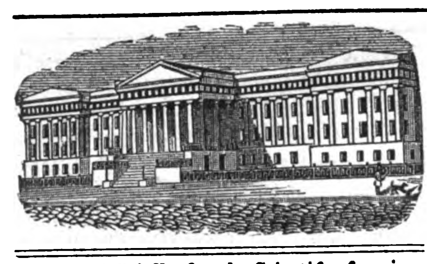
Three years ago, a balloon of a conical form, like the above described one, was to start from New York to San Francisco with the certainty of a Liverpool packet; we believe the case of that balloon has attained to that point of advancement which is called "varnished and depending on dry weather for final completion." Two years ago Capt. Taggert came to this city with his propeller balloon to be navigated upon the same principle set forth by this same wise inventive G., of the "Times." We were present when he endeavored to make an ascent from Jersey City, he came near losing his life by being dashed to pieces. He was precipitated into the canal, and his car was separated from the balloon, which darted up after its rope was cut, and sailed away down by Long Island Sound. We were sorry for the little captain, as he had made a number of successful attempts before, but as we have always said "every balloon ascent is fraught with danger." The pear-shape for a balloon to be carried with the currents of the atmosphere is better than a cylindrical shape, because it is a form which will enable the car to be carried more steadily. There is a tendency in every balloon to keep spinning on its axis, a long cigar balloon would therefore oscillate like a drunken man. The spirit gas stove would be dangerous in the extreme. If the atmosphere could be navigated as safely as the ground is traversed by a railroad car, a new era would begin on this world, such an invention would be the most important of the present age, which is so prolific in discovery. But this cannot be done by old plans revamped, either to gain notoriety or for some other purpose. At the present moment the science of ballooning is so far advanced that very safe ascents and descents are sometimes made by experienced aeronauts, but as a useful art for navigating the atmosphere and carrying passengers from place to place, this has not yet been done, and by all the present knowledge or ballooning it cannot be done, neither by G. nor A. B. C. He who can do it, let him, instead of publishing some balderdash on the subject, get up his balloon, advertise to sail to Philadelphia and back, or to Albany and back, and do it, and then he will receive, as he would deserve, the plaudits of the world and the rewards he so richly deserves. Until he does this, let him hold his tongue, and cook his soup on his *spirit gas stove.*

About the Prizes.

In No. 46 of the last volume of the Scientific American, we announced our intention to award four valuable prizes for the four largest lists of subscribers, furnished within three month from the issue of the first number of the present volume. These prizes are of sterling value, and are regarded as eminently worthy ot energetic competition. A superb Silver Pitcher, worth sixty dollars; a set of the Iconographic Encyclopedia of Art, Science, and Literature, a work of great magnitude and utility; Dempsey's Machinery ot the Nineteenth Century, and C. B. Stuart's work upon the Naval Dry Docks of the United States constitute the prizes offered. Competitors are not compelled to confine their efforts to one locality, and every advantage of clubbing is guaranteed, therefore there can be very little difficulty in procuring a list of subscribers in almost every town where any interest at all is manifested in the industrial pursuits of the country; and who would be willing, in this enlightend period to acknowledge an indifference upon this important subject? Every person should cultivate a taste for the Arts and Sciences; it is necessary to a well ordered judgment. The few who have thus far offered lists in competition, assure us of the little difficulty they experienced in securing them. After the number reaches twenty, the clubbing rates are $1,40 each. This is certainly cheap enough for a complete volume of the Scientific American.

There are many who suppose they have no chance against parties residing in larger places—this is certainly an erroneous view of the subject, because in the more populous towns is generally to be found an agent who receives numbers sufficient to supply the greater portion of mechanics and manufacturers, and in some instances two or more persons would enter into the competion.

Whoever may succeed in securing one of the prizes will, we feel assured, be highly gratified with it, and we ask our readers to engage in the work spiritedly never doubting success. This is the one and only way to achieve success in any undertaking. Our readers will bear in mind that regular local agents of the Scientific American are not recognized as competitors.



Reported Officially for the Scientific American

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING SEPTEMBER 28, 1852.

SHOES AND GAITER BOOTS—By Jos. Brackett, of Swampscott, Mass.: I claim the improved gaiter boot or shoe, as made with a lap piece separate from both the quarters, and extended up from the instep part of it, in combination with so applying button holes and buttons, or their equivalents, to the said lap piece, and the two quarters, as to enable the two quarters to be directly connected by the lap piece, substantially as specified.

JOINTED BED PLATE SAW GUMMER—By Hosea O. Elmer, of Mexico, N. Y.: I do not confine myself to any particular mode of doing this, viz., supporting the bed piece; nor do I confine myself to the particular mode of construction of the several parts, as described, but any other method substantially the same, so long as the bed piece is jointed, and one part capable of being clamped, when in line, or at an angle with the other part.

I claim the employment or use of the cylindrical cutter, said cutter having a rotary and also a reciprocating rectilinear motion, in combination with the jointed bed piece, in which the saw is placed, the cutter having the motions communicated to it in the manner described, or in an equivalent way, and the bed piece being constructed substantially as described, by which combination saws may be filed, gummed, and jointed in an expeditious and proper manner, as set forth.

PIANOFORTE ACTION—By Geo. Howe, of Boston, Mass.: I claim jointing the fly of the jack to the stem of the same, so as to constitute a lever, the short arm of which has to move but little distance before it strikes against the regulating button, for the purpose of preventing any noise or "slapping," as set forth.

THROSTLE SPINNING MACHINES—By Charles H. Hunt, of Lawrence, Mass.: I claim the escapement wheel, its escapement lever (composed of the arm and pallets), and stud, in combination with the reciprocating rotary mechanism, composed of the wheel, its concentric, and endless grooves, rows of pins, the pinion, and pendulous bar or arm, the whole being applied to give motion to the shaft, its pinion, the gear of the shaft, and the said shaft, in order to effect the movements of the spindle rail, or rails, essentially as specified.

SAW MILLS—By Hazard Knowles, of New York City: I claim the adjustable ways of the saw gate, when they are connected with each other in such a manner that they can be simultaneously and uniformly varied and adjusted in their positions, whilst the saw gate is in motion, for the purpose of varying the amount of the cutting action of the saw, substantially as set forth.

I also claim the connecting and arranging the feeding apparatus with the saw gate, and the adjustable ways thereof, in such a manner that the feeding motion communicated to the material operated upon, will invariably be in perfect harmony with the cut of the saw, and also in such a manner as will enable me to ease the action of the saw, when passing through knots, and at any time adapt it to the nature and the depth of the material operated upon, substantially as set forth.

BRICK KILNS—By Richard E. Schroeder, of Rochester, N. Y.: I do claim so arranging the several compartments of the kiln, each provided with a fire-place in a circuit, and connecting them with each other and with the fire places and chimneys, by means of flues and dampers, that one compartment after another may be charged with fresh brick, and the brick be successively dried and heated by the waste heat, burned, cooled down and removed, substantially as set forth.

LATH MACHINES—By Henry O. Smith, of Cleveland, Ohio: I claim the combination of the method of rotating the log, or bolt, from which the laths are to be cut, by means of the poppet wheels, arranged, respectively, on the shafts, and forms a part of the mandrel at each end of the log, and the gear wheel or their equivalents, moving with equal velocities, so as to prevent any wrenching or twisting of the log on the centres, and to hold it firmly up to the knives, whilst being operated upon by them, and the method of clutching and releasing the log by means of the dog, hollow bearing for containing the clutch head, and hollow shaft for receiving the rod, which screws into said clutch, and by which the dog may be driven into the log, or the log released, the whole being arranged and operating substantially as set forth.

SOUNDING BOARDS OF PIANOFORTES, etc.—By Alfred Spear & Ernest Marx, of Aquackanock, N. J.: We claim making the sounding board of a pianoforte or other stringed musical instrument, and arranging the strings and all appendages thereto, in the form of a cylinder or part of a cylinder, or in any of the forms we have mentioned, as considered to be equivalent, the said board having its ends secured between two discs or heads, and having no other support except that derived from the said discs or heads.

MACHINERY FOR FORMING SHEET METAL TUBES—By O. W. Stow, of Southington, Ct.: I do not claim the manner of forming tubes by means of a rod and concave bed, irrespective of the manner of operating the rod, for they have been previously employed, the rod being operated or driven, in the bed, by means of a mallet or hammer operated by hand or by means of levers or cranks moved by gearing.

I claim, first, the method of mounting and operating the rod, within the concave bed, in the manner described, viz., the ends of the rod being attached to the slide rods, E H, and slide rods passing through the vertical guides, and having spiral springs around them, the lower ends of the slide rods being attached to levers, by operating which the rod is forced within the concave bed, and the lower portion of the tube formed.

Second, I claim the hinged folders attached to the wings, which are hung on points, said points being in line, longitudinally, with the centre of the rod, and operated in the manner and for the purpose of forming the upper or remaing portion of the tube, as set forth.

REGISTERS FOR OMNIBUSES AND FOR OTHER PURPOSES—By J Z A. Wagner, of Philadelphia, Pa.: claim fitting toll passages with a registering step, combined with mechanism in such manner that the aggregate number of full and fractional tolls due from passengers, will be reduced to the denomination of full tolls, and registered, whatever the proportions may be in which the aggregate is composed of fractional and full tolls, substantially as set forth.

BELLOWS FOR REED INSTRUMENTS.—By Isaac T. Packard, of Campello, Mass.; I claim the employment, in all reed instruments, of bellows having two chambers, in one of which a vacuum is produced, and in the other air is compressed, the said chamber being on opposite sides of the reeds and communicating with each other, by the vacuum, which draws it through at the same time; this I claim without reference to the precise construction of the bellows, or the mode of operating them.

ELECTRO-MAGNETIC ENGINES—By John S. Gustin, of Trenton, N. J.: I claim the application of a spring or springs, or their mechanical equivalent, used as recipients of the excess of power in the closing of the electro-magnets and armature to be imparted again to the next, as described and set forth.

MACHINES FOR POLISHING LEATHER—By John M. Poole, (assignor to J. Pusey & James Scott,) of Wilmington, Del.: I claim connecting or fastening the stand or stands that hold the polishers of burnishers, to a belt, so as to traverse them in ways or grooves, or under a plane, substantially as described.

NOTE—In the above short list of patents we are happy to recognize four inventions which were secured through the Scientific American Patent Agency. Nearly every week from four to six patents issue, which were obtained through this Office.

Liebig on Fermentation and Disease.

When we compare the phenomena of putrefaction and fermention with the processes in the living animal body, it becomes very probable, that a number of effects, which we are accustomed to refer to peculiar vital influences, are determined by the same causes on which fermentation and putrefaction depend. These analogies have been noticed and pointed out for centuries by philosophers and physicians; but even now many of the latter class consider, in opposition to the view here developed, certain vital actions or manifestations of vitality as causes of putrefaction and fermentation.

It has been stated above that the constituents of the mass of the body, albumen, fibrine, membranes, skin, and caseine, when putrescent, exert a peculiar influence on many substances, the visible result of which is a chemical change in the substance brought in contact with these compounds. It is further an established fact, that the products derivable from the substances thus acted on are not always the same, but vary with the state of decomposition of the ferment or exciting body.

But if a change of position and arrangement in the particles of animal substances can exert, out of the body, a very decided influence on a number of organic compounds; if the latter, when in contact with these ferments, are decomposed, and new compounds, less complex formed of their elements, and it we reflect that to the class of fermentescible substances belong all the matters which constitute the various articles of the food of men and animals, then we can hardly doubt that this cause of change plays an important part in the vital processes, and has a chief share in producing the changes which the constituents of the food undergo, when they are converted in the body, into fat or into tissues forming parts of organs, or in the formation of the secretions and excretions, such as milk, bile, urine, &c. We know, indeed, that in all parts of the living animal body, a change of matter is going on at every moment of time; that living parts are expelled; that their constituents, albumen, fibrine, membranes, and all the rest, whatever their names, arrange themselves in the moment of their separation from the living tissue, and subsequently into new products; and our experience compels us to conclude that by this change of quality and composition itself, at every point where it occurs, and according to its force and direction, a parallel and corresponding change is effected in the composition and quality of all the constituents of the blood, or the food, which come into contact with them, and that, consequently, the change of matter is a chief cause of the changes which the food undergoes, and also a condition of the process of nutrition; that with every change effected by a cause of disease in the process of transformation of an organ, of a gland, or of a constituent of these, the action of that organ on the blood conveyed to it, that is, the quality of its secretion is likewise altered; that the action of a multitude of remedies depends on the share which they take in the change of matter; and that, in many cases, this action of remedies, by changing, accelerating, retarding or arresting the direction or the force of the agency which operates in the organ, exerts an influence on the quality of the blood.

Finally, by a knowledge of the causes of the origin and propagation of putrefaction in organic atoms, the question concerning the nature of many contagions and miasms becomes capable of a simple solution, and may be reduced to the the following:—

Are there facts which prove that certain states of transformation or putrefaction in a substance are likewise propogated to parts or constituents of the living animal body; that, by contact with the putrescent matter, the same or a similar condition is produced on such parts, as that in which the particles of the putrescent body are? This question must be answered decidedly in the affirmative

It is a fact, that dead bodies in dissecting-rooms frequently pass into a state of decomposition which is communicated to the blood in the living body. The slightest cuts with the scalpels used in dissecting often cause a very dangerous and even fatal disease. The observation of Magendie, that putrid blood, brain, bile, or pus, when laid on fresh wounds, produce in animals vomiting langour, and death, after a shorter or longer interval, has not yet been contradicted.

Further, it is a fact, that the use of various articles of food, such as flesh, ham, sausages, if in a certain state of decomposition, is followed, in healthy persons, by the most dangerous and even fatal symptoms.

These facts prove that an animal matter, in a certain state of decomposition, is capable of exciting a morbid action in the body of healthy individuals. Now, since by the term, products of diseased action, nothing else can be meant, than parts or constituents of the living body which are in a state of change in form and quality different from the normal one, it is evident, that, so long as this state continues, and the change is not completed, the disease may be communicated to a second or third individual, and so on.

Besides, when we consider that all those substances which destroy the communicability or arrest the propagation of contagions and miasms, are likewise such as arrest all processes of putrefaction or fermentation; that under the influence of empyreumatic bodies, such as pyroligneous acid, which powerfully oppose putrefaction, the diseased action in malignant suppurating wounds is entirely changed; that, in a number of contagious diseases, especially in typhus, ammonia, free or combined, is found in the exposed air, in the liquid and solid excretion, (in the latter as ammonio-phosphate of magnesia), it seems impossible any longer to entertain a doubt as to the origin and propagation of many contagious diseases.

Finally, it is an observation universally made, and which may be regarded as established, "that the origin of epidemic diseases may often be referred to the putrefaction of great masses of animal and vegetable matters; that miasmic diseases are found epidemic where decomposition of organic substances constantly goes on, in marshy and damp districts. These diseases become epidemic under the same circumstances, after inundations; and also in places where a large number of persons are crowded together with imperfect ventilation, as in ships, in prisons, and in besieged fortresses." But in no case may we securely reckon on the occurrence of epidemic diseases, as when a marshy surface has been dried up by continued heat, or when extensive inundations are followed by intense heat.

Hence, according to the rules of scientific research, the conclusion is entirely justified, that, in all cases, where a putrefactive process precedes the occurrence of an epidemic or contagious disease, or where the disease can be propagated by means of solid, liquid, or gaseous products of diseased action, and when no other cause for the disease can be discovered, the substances which are in a state of transformation are, in virtue of that state, to be regarded as the proximate causes of the disease.

The well-informed and attentive physician has been long aware that the difference between good and wholesome food, and that which is bad, which latter is justly regarded as the cause of many diseases, depends, not on the nature of the food, but on a certain quality or state of it, which, in the case of flesh, for example, can often be referred to a diseased state of the animal from which it was taken. He knows that the useful and beneficial effects of a proper ventilation on the preservation of health, may be often attained, in the chamber of the sick, for example, by the evaporation of small quantities of nitric acid (not of chlorine, which, in most cases, has an injurious, or at least an irritating, effect), or by the burning of a little sulphur; by means of substances, therefore, of which we know that they destroy noxious gases, or put an end to their state of decomposition.

On Cattle Feeding.

As this is the season when feeding cattle for winter beef is a prime object with all farmers, and also when he should prepare to lay out a system for winter feeding, we presume that a few remarks on this subject will be as words in right season.

In a great many cases cattle feeding is badly managed on account of irregularity. Although this is so common, and the consequences so palpable, yet it is a point very apt to be overlooked. If we were to ask six people how they use a certain kind of food for their stock, we should probably get as many different answers. Some may use hay and turnips, giving plenty of the former, and sometimes of the latter, just as they find it convenient to provide them. The hay is given in large quantities at one time, with the injunction to let them have no more till they have finished what they have got. But the best method in this is on the principle of little and often. One day they get turnips in such large quantities as to produce the symptoms, and no doubt some of the effects of scouring, and at another time they have so few that they are bound up in the bowels. And after trying this up-and-down way of it for a time, it is found out that the beasts hardly pay the expense of carrying the roots for them, and the whole plan is condemned as unprofitable. Perhaps some artificial food is used, but instead of giving it regularly as to time and quantity, they get it just as it suits the parties in charge; and as the beasts eat it readily, and are anxious to get it, having no stated time for that, they are always on the look-out whenever they see the the feeder, and are deprived of that rest which they ought to enjoy.

A good plan for feeding is to give the cattle hay when they are cleaning out in the morning, then give each about a bushel of turnips, and litter them deep, and after breakfast give each about another bushel of turnips, or half turnips and potatoes cut up, and leave them till noon; this is for stall feeding. The cattle want to lie soft, and enjoy rest, in order to grow fat. About one o'clock, they should get another feed of turnips, and a few potatoes, about a quarter of a bushel of each, and at 2 o'clock a feed of good hay. At 5 o'clock, P. M. they should get some hay, and be cleaned out again, after which they should be well littered for the night, get some fresh hay in their racks, and a composition food of boiled pumpkins, potatoes, and indian meal, slightly salted; after which, let them rest for the night. Turnips should never be given in a frozen state, yet some farmers never think about this; the cattle should be kept in moderately warm, dry, and well ventilated stables.

For winter feeding, cattle should get their food, as regular as the feeders. Dry hay is a sorry morsel, day in and day out, and especially heated hay, that miserable stuff, deprived of half its origical nutritive qualities by heating in the mow. This kind of hay is too plenty. Potatoes and turnips, or cabbages and bruised indian corn should be given to all cattle, young and old, at least once per day during the winter season. Every farmer, should have a large iron boiler in a well-built shed, and food should be boiled in it once every day for milch cow; chopped straw, hay, crushed oats, a few potatoes, turnips, cabbages, &c., make palatable and comforting meals for neat cattle, but food must be given at stated times, or the good effects of cooked meals will not be exhibited.

By the latest accounts from Australia, more new gold deposits had been found, and the yield is greater than ever.

TO CORRESPONDENTS.

E. C. A C., of Ill.—Your letter we could not publish, because there are expressions of a libelous nature in it, and because it is merely the expression of your feelings. If you have any knowledge that Mr. Mears' statements are not correct, and if you are acquainted with the real facts, then we are always willing to correct errors. We would give the same advice again. We wish Mr. Parker well, and defend his just rights, when justly enforced. We are the foes of all willful patent pirates.

H. S., of N. H.—A weighing scale, upon your plan was proposed to us a year since, [illegible], we believe, a caveat was filed at the Patent office. We have since learned that it proved a failure—not accurate.

W. B., of Ohio.—Your favor of the 20th instant, came duly to hand. The sketch of the barrel machine, we remember to have seen in the hands of your brother; but he did not describe it to us. Some days since we sent him a note requesting him to furnish us with the sketch. As he has not done this, we presume he is out of town. Will you please furnish us with a sketch and description?

W. G. H., of Pa.—Our Office is opened at all hours every day in the week, and inventors are cordially invited to bring forward their models. We will examine your "harvester," at any time.

T. H., of Pa.—We do not see any important advantage to be gained from the use of lead on the tread of locomotive wheels. Any soft substance would be objectionable in our opinion. You could try an experiment.

R. J. McC., of S. C—Messrs. Rees & Hoyt, are at No. 37 Spruce-street, this city.

J. H. & Son, of S. C.—We shall attend to your order without delay.

A. W., of N. Y.—We are much obliged to you for attention to the article of pure chloroform. We know that Dr. Simpson published a pamphlet on the subject, but we neither have it nor Chambers' Journal. If at any time you find it convenient to leave the Journal, we will take care of it, return it safe, and be your obliged.

H. B., of Ct.—A process of coating iron with copper was patented in 1849. The iron having been cleaned and prepared in the usual manner, with dilute oil of vitriol, is quickly dried and immersed in a thick cream of clay and water, and again quickly dried; and, with the covering of clay upon it, suddenly depressed in the bath of melted copper—by which the clay flies off, and the metals firmly combine.

J. S., of Ga.—We do not think you will succeed with such a claim as you have suggested. It is the contrivance, and not its peculiar adaptation to any special object, which forms the subject of the patent. The eccentric hook appears to be new; although, we can see no special grounds for a patent. We have seen the other arrangement, and cannot advise an application.

T. P. H., of Tenn.—The steam propeller Albatros, built in Philadelphia, and now running on the north-eastern coast, is fitted with oscillating engines constructed upon substantially the same plan as yours. At least, we are of this opinion.

B. N., of N. Y.—We like the construction of your jack, very much; and think it new. You had better send us a model of it. The cost of an application for a patent, will be about the same as your former case.

M. F, of Va.—It would not be honorable in us to furnish the highest number of subscribers received in competition for the prizes. Whoever sends the largest number will be sure to receive the first prize—the next largest, the second, etc

J. H., of Pa.—Through the columns of the Scientific American your invention will receive extensive publicity. Its influence is acknowledged on all hands. It circulates widely, and is relied upon as an independent and fearless journal.

E. A. D, of Me.—We can see neither novelty nor utility in your alleged improvement in dyeing. One of the ingredients must injure the texture of the cloth. It cannot be otherwise.

J. H. S., of Ohio.—A machine called the "Archimedian," invented by Mr. D. J. Murphy, of Ireland, has been used in Great Britain for some time. An Engraving of it you will find in Vol. 1, "London Expositor," page 244. It is substantially the same as yours; hence, we cannot advise you to apply for a patent.

B. D. W., of Ct.—In No. 1, Volume 5, Scientific American, you will find an engraving of Yates' Pulley Engine. We have not heard of its adoption by any Company.

C. D., of Tenn.—Provisional protection is granted for six months, under the new law. We can proceed with the case at once.

H. D. S, of Mass.—Howe, the patentee of the Bridge you mentioned, died not long since; several of his bridges are in use. We can think of none near you, except the one across the Connecticut river, at Springfield—which you could very easily examine. It has obtained considerable reputation.

J. T., of Md.—We think you are entitled to have an interference declared between your claim and Mr. C. You had better request the Commissioner of Patents to do this—stating your reasons. Should the Commissioner declare an interference, he will notify you of the time for receiving the testimony.

C. H., of Canada.—The reason why the Esquimaux are fond of train oil and whale blubber is obvious. The train oil and blubber contain large quantities of carbon and hydrogen, which are very combustible; and, as these people live in climates of intense cold, the heat of their bodies is increased by the greasy nature of their food.

G. A., of Mich.—To make hydrogen gas, put some pieces of zinc or iron filings into a glass: pour over them a little sulphuric acid, (vitriol,) diluted with twice the quantity of water; then cover the glass over for a few minutes, and hydrogen gas will be given off.

M. M, of Md.—The Usher Steam Plough, illustrated in the last Volume of this journal, is advertised in the English papers to till ground at the rate of seven acres per day, at a cost of $4,50. We have never heard of any trials; although, we presume some have taken place.

P. P., of Miss.—You ask our opinion of water cure. Not having paid very much attention to this subject, we recommend you to enclose $1 to Messrs. Fowler & Wells, of this city, and precure the "Water Cure Journal," an excellent monthly.

H. F., of Geo.—We find that a patent for an improved mastic, was patented in 1845. It consists in the substitution of red sandstone and clay, reduced to a powder in their natural state, or argil, silex and the oxyde of iron, for the stone of Sessyl, or Val du Travers, or other assimilated materials, in combination with the mineral tar of Sessyl, or any other bitumens used in the formations of mastics.

J. K., of Ohio.—Your rotary engine is the same as that of Hornblower's in principle.

C. R., of N. Y.—There is no doubt but you have hit upon an excellent discovery, and should secure it by patent as soon as possible. It is to be hoped that you will not neglect this advice, for we think you will make money by it.

J. S., of Pa.—You must be careful to conceal your model until you make appliication for a patent; it is an invention which can easily be purloined. Now be careful.

R. G., of Va.—The power of a water-fall is according to its height and the quantity of water discharged in a given time. How can we tell its power by the height of the fall? it cannot be done.

H. R. R., of Mass.—Castings are bit down by sulphuric acid—iron castings we mean. It is best to cast in such a manner that the acid will not be required.

Money received on account of Patent Office business for the week ending Saturday Oct. 2:—

I. H., of Ohio, $10; G. B., S., of N. Y., $30; J. B. W., of Me, $40; A. T., of N. Y., $30; P. D., of Pa., $20; J. S., of Ohio, $20; P. W. LaR., of N. Y., $20; J. R. H., of Mass., $C0; J. G., of N. Y., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Oct. 2:

T. B. H., of Ohio; P. W. LaR., of N. Y.; P. D. of Pa.; J. S., of Ohio; J. G., of N. Y.

Cheap Postage—Important to Subscribers.

The amended postage law, as enacted by the last Congress, having gone into effect on the 1st inst., we take occasion to make an extract from one of the sections, from which our mail patrons will see that the item of postage on the Scientific American will in future be less by one-half than formerly.

"Any periodical or newspaper, under three ounces in weight, can be sent to any part of the United States for one cent, and if paid quarterly or yearly in advance, either at the office of mailing or delivery, will be transmitted by the mails for half a cent each number; that is, for a daily paper, the postage will be only thirty nine cents a quarter, or one dollar and fifty cents a year; a weekly paper or periodical will be charged only six and a half cents a quarter, or twenty-six cents a year. If the weight does not exceed an ounce and a half, it may be circulated in the State where published at half of the above rates."

According to the above extract, subscribers to the Scientific American, residing in the State of New York will receive their papers by mail at thirteen cents per annum, instead of thirteen cents per quarter as formerly, thus reducing the cost of the Scientific American thirty-nine cents per annum to mail subscribers—an item worth saving.

Subscribers in the most remote part of the country will be required to pay but six and a half cents per quarter in future for the Scientific American, and although some postmasters may insist upon higher rates, our patrons should resist the attempt to extort money from them by any pretended construction of the more obscure points in the statute which tends to such an end.

Back Numbers and Volumes.

In reply to many interrogatories as to what back numbers and volumes of the Scientific American can be furnished, we make the following statement:

Of Volumes 1, 2 and 3—none.
Of Volume 4, about 20 Nos.; price 50 cts.
Of Volume 5, all but 4 numbers, price, in sheets, $1.
Of Volume 6, all; price in sheets, $2; bound, $2,75.
Of Vol. 7, all; do do do

Patent Claims.

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

Patent Laws, and Guide to Inventors.

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

SCIENTIFIC MUSEUM.

What is Heat?

What is combustion?—what is heat?—are questions not easily answered, if, indeed, they can be answered at all. The most familiar phenomena have baffled every attempt to penetrate their secret. No single hypothesis has been framed which can account for all the facts observed, and perhaps the most ingenious theories of our philosophers may be as far from the true nature of heat, as were the speculations of the ancients, or the fanciful phlogistic theory of Stahl, which the progress ot discovery long ago consigned to the tomb of the Capulets. In reviewing the history of the fluctuations of theoretic views relating to heat, we cannot be surprised by the sarcasm of Schelling, that "most men see in philosophy only a succession of passing meteors."

But whatever uncertainty may attach to the cause of heat, none belongs to its phenomena. The researches of Black, Melloni, Herschel, Faraday, and others have made us familiar with the means and results of exciting it, and with the laws which govern its manifestations. Those researches show that there exists a constant and very intimate relationship between heat, light, and all the Protean forms of electricity, magnetism, and chemical action; that they may all be made to produce one another interchangably, either as forces or effects; and that probably they are all, not distinct, or merely related forces, but only modifications ot a single force pervading all space, of which also gravitation may be a residual quantity. These researches have at least proved that heat and light are not material substances added to or substracted from bodies under their influence; for, at the pleasure of the experimenter, two rays of light may be made to produce total darkness, or a spectrum of double intensity; and the same may be done with two rays of heat. We cannot conceive that two material rays could either annihilate or augment each other in the manner described; but we know that two forces may destroy or double their total resultant effect, according as their impulses oppose or coincide with each other. This and similar observations have induced an increasing majority of philosophers to adopt the undulatory theory of light, heat, and electricity, which supposes all space, and the interstices of all matter, to be filled with an exceedingly rare and elastic fluid, which, for want of a better name, has been called ether.

Wild Rice.

In the shallow muddy places of some northern lakes, there grows a serial named wild rice, which is used by the Indians; and by those who have partaken of it, we have been informed that it was equally as palatable as the cultivated rice of the South. An acquaintance of ours was recently in Canada, and visited Rice Lake, a shallow body of fresh water, near Coburg, where this edible grows in great luxuriance, and is claimed by the Indians there as their especial harvest property. It is about twice as long as common rice, and is of a very dark color. There is a sort of coarse bran like husk; the plants stand as closely together as oats in a well cultivated field. The squaws and Indians gather it in their canoes by holding the heads over their canoe and beating them with heavy round sticks. They kiln dry it in their own way, and then thrash the grain out in a small hole in the ground, often lined with a deer skin. This is done by treading it with the feet or pounding it with an Indian pestle, just as they choose.

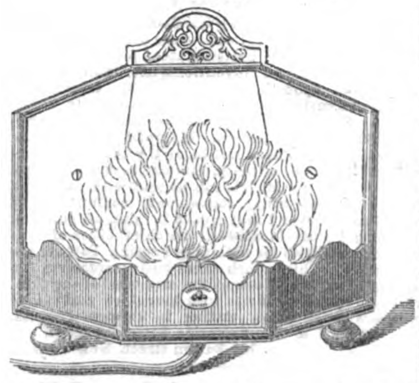
On the banks of the lake may be found a kind of grass which is not seen elsewhere, and which appears to be an imperfect kind of rice. The rice will grow in deep water, say twelve or fourteen feet, but does not there bring the grain to maturity. Flocks of ducks, in astonishing variety and number, frequent the lake in the autumn, and grow so fat that they can scarcely raise themselves from the water. But they are well aware of this misfortune, and manage to keep out of the way nearly as well as at other times.

A Model Telegraph Line.

A line of electric telegraph has just been established in France, which may be regarded as a model telegraph. It extends from Paris to Bordeaux. The wires, ten in number, go the whole distance under ground. They are five inches apart, and form a hollow square. To guard against humidity, they are supported upon wooden blocks, with the necessary isolation, and encased in a coating of gutta percha and lead. An ingenious contrivance enables the guardians to detect at once the exact spot where any flaw or break has occurred without the digging up of any portion of the trench.

Gas Stoves.

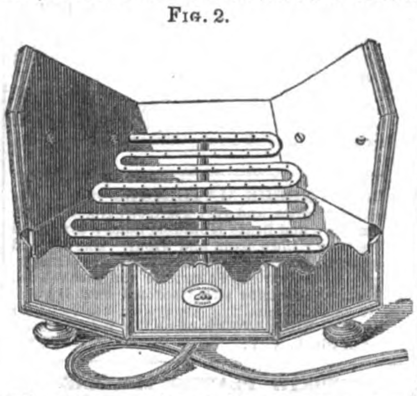
FIG. 1.



On page 3 of our last volume, we decribed an invention of G. Bachoffer, and N. Defries, of London, for artificial fires in grates, &c. the improvements illustrated by the annexed engravings are a modification of the same by a Mr. Goddard, and was described in the London Artisan of September, ult., from which we have selected the illustrations.

Figure 1 represents the stove which has a burner of the gridiron form, over which are sprinkled a few asbestos shavings, which ignite and sparkle in a warm like, cheerful manner. Figure 2 shows the burner, and fig. 3 is the same stove shut up. The backs and sides of these stoves are lined with porcelain, which reflects the heat and is easily kept clean. The object of this stove is to use gas, and not coal. For this purpose all that is necessary is just to have a perforated serpentine, or coiled tube situated near the bottom

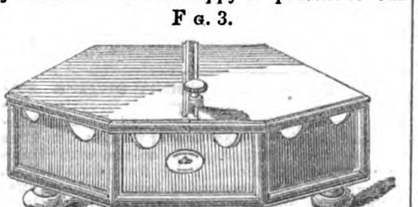
FIG. 2.



of the stove. A fire can be made in a stove of this kind in a single minute; the heat is intense and the flame clean; there is no ashes, no smoke, and the amount burned according to the degree of heat desired for a room, can be regulated with the utmost nicety by the supply cock. These stoves are now employed in London; the gas is supplied by public gas companies, and the expense is less than the common coal stove.

We have more than once spoken of the great benefit and improvement that would be affected among all classes of our citizens, if gas was supplied at a moderate price to every house. We are happy to present to our

F G. 3.



readers something tangible—a practical fact—to enforce and illustrate the views we have heretofore inculcated. If gas could be supplied to every house in our city, for heating purposes in the manner represented, so as to produce as great a warmth in rooms, at as little cost (even if it were one-half more) as coal in our common grates and stoves, we believe that many blessings would be conferred upon our citizens. In London cooking of every description is performed in large eating houses by means of gas stoves. They are excellent for roasting meats, because the intensity of the heat can be regulated as required.

In New York the price of gas is too high to allow of its use for any such useful purpose, it being no less than $3 per 1,000 cubic feet, while in London it is not half this price. It appears to us that it could be manufactured much cheaper, and as great profits made, owing to an undoubted increased consumption. There are many places in our country, especially in Virginia, where the coal ror making gas is so plentiful that it can be made very cheap, and wherever this can be done, we recommend its use for heating purposes, as well as for illumination. At present gas is only used for illumination in our country so far as we know, except for singeing cloth in calico and bleachworks. Our remarks need not be prolonged, the subject is plain and simple, and we are sure it must recommend itself to every sensible person in our country.

Keeping Apples.

Mr. Pell, of Ulster Co., N. Y., the celebrated exporter of apples to Europe, recommends that apples after having been picked should be laid on a floor, by hand, without pouring from the baskets, until they are twelve to eighteen inches deep, and be left to dry and season three weeks; when again packed in clean barrels, they may be kept any reasonable length of time and safely sent to any part of Europe or the East Indies. The plan of drying and seasoning them prevailed generally some years ago, though now-a-days it is mostly discontinued and considered useless. We are disposed to think favorably of this process when it becomes important to keep apples safely till next spring to send to foreign countries, for we have always observed that after opening a barrel a few days, after being put up, in ever so dry weather, that the moisture often stands in drops over the whole surface, and although loose barrels will allow it mostly to evaporate, yet when they come in contact, the two surfaces retain it and cause rot.

The carrying of apples in a common wagon, either before or after barrelling, is injurious—they should be moved on springs or on sleds. The least abrasion of the skin, or crushing of the cells of the pulp containing the juice, allows fermentation and decomposition, and the consequent decay of the whole mass.

If apples are carefully picked and handled, and packed in saw-dust which has been carefully dried, they can be carried safe and will keep longer and better than by any other method of packing. The dry saw-dust absorbs all the moisture which may come out of them, and being a good non-conductor, it preserves them in all temperatures better than by any other plan; still, apples should always be kept in a cool, dry place, the temperature, if possible, should be nearly as low as the freezing point.

A New Plastic Material.

A Parisian sculptor, M. Duthoit, has obtained an English patent for a chemical combination of certain agents for obtaining a new product to be used in the plastic arts. The patentee combines with gutta percha, oxide of zinc, amianthus, and sulphate of baryta, in conjunction with various colors. The gutta percha is first prepared and bleached by being dissolved in rectified naphtha, benzole, or sulphuret ot carbon. When the compounds do not possess sufficient elasticity, caoutchouc is added. The gutta percha being prepared, after filteration he places the solution in a still, adds the other ingredients, and stirs the whole well together. Heat is then applied until all the volatile oil is driven off, when the material is removed to the desired moulds. It is said to be suitable for numerous moulded works of art, tissues, or artificial flowers; it may be used as leather, when rolled into sheets, or it may be diluted with naphtha, or benzole, and employed as liquid paint.

Horned Rattle Snake.

Mr. William H. Thomas, of Qualla Town Haywood Co., N. C., writes to the Asheville News that a Cherokee Indian, named Salola, captured a snake on the Smoky Mountain, which he describes "of the usual size of Diamond Rattle Snakes found in the mountains of this country, of a dark color—on its tail it has ten rattles, on its head two forked horns of about three fourths of an inch long." The Indians said it seemed to be a king among snakes of its species. Nothing of the kind has been seen heretofore by any of the oldest white inhabitants.

The Patent Office.

The Patent Office is now undergoing improvement, workmen being engaged in trimming the exterior walls of the main building. The east wing is rapidly approaching to a completion. The rooms have been plastered, and are nearly ready for painting; the beautiful and massive marble columns of the front portico have been set, and the movements generally in and about the premises seem to promise a finish by the first of December. Incipient measures are in progress for an early commencement of the west wing. When this shall have been completed, the Patent Office will indeed be the pride of the country and a monument of its inventive genius.—[Republic.

[We are glad of all this; it should have been done long ago. The law providing for the display of models in the patent office has been a dead letter for a long time, on account of the gallery being occupied with objects ot natural history, which should never have been admitted there. A museum should have been built for them, rather than that thousands of models should have been suffered to lie rusting hid up in the cellars of the Patent Office. It is a shame and disgrace to our country to see laws suspended in the execution, for one purpose more than another. We hope soon to see the whole Patent Office devoted to its appropriate purposes, viz., things connected with inventions, science, and art.

The Duke of Wellington always slept in a hair mattrass; all those chaps who aspire to military fame might thus learn a lesson where feathers are plenty.

LITERARY NOTICES.

WALL STREET JOURNAL.—We are under renewed obligations to our friends of this journal for their repeated compliments to the Scientific American. The notices do not escape our attention, as we are weekly readers of the Journal, and can bear testimony to its sterling character. Price of the Wall Street Journal, one year, $2; Robinson & Co., No. 15 Merchants' Exchange, publishers.

AMERICAN UNION—A new volume of this sterling literary and family journal, commences in two weeks. Terms $2 per annum. This journal is ably and efficiently conducted by R. B. Fitts, Esq., and is filled weekly with excellent original stories and miscellany.