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Hasheesh and its Smokers and Eaters.

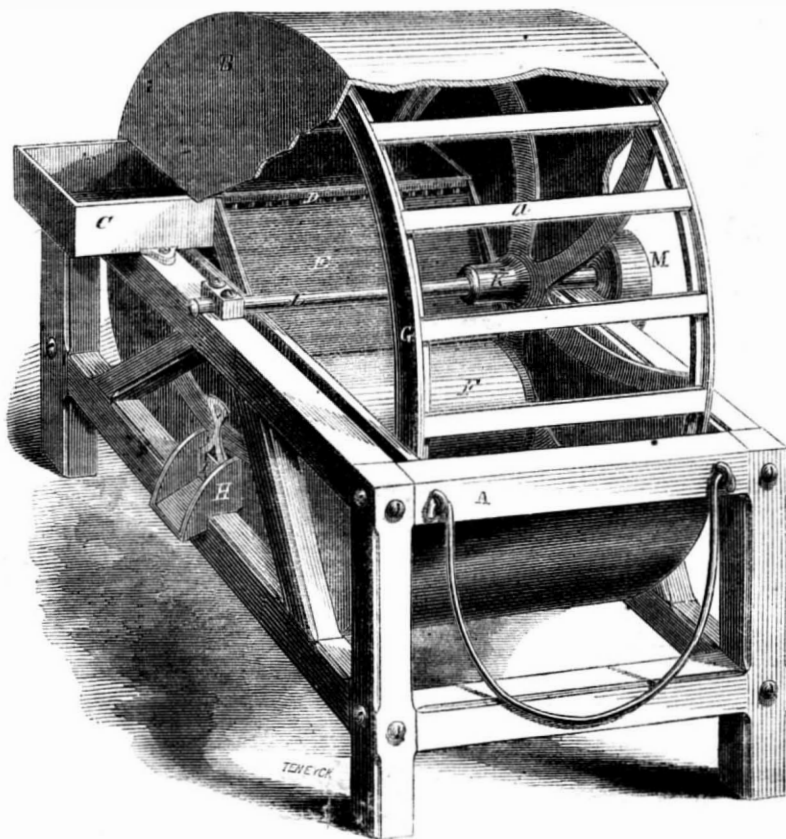
The drowsy appearance and indolent character of Eastern nations is not only due to the climate of the countries, and the almost spontaneous production by the earth of everything necessary for the life of man, thus in a great measure rendering labor unnecessary, but it is aided and increased by the use of powerful narcotic drugs. The Chinese have their opium which they chew and smoke to great excess, as it produces a delicious dreamy sensation that is relished by the inhabitants of that most conservative country. We have often seen the celestial cigar-sellers in this city looking with a bewildered stare at the passing crowds, as if the noise of our bustling traffic was interfering with the sensations they sought to obtain from the opium they were smoking through bits of reed. The Ottomans, that is the nations inhabiting the north of Africa, the southwest of Asia and a portion of Europe, prefer the intoxication produced by hasheesh, which is a preparation of the Indian hemp, and which they smoke under the names of kiff, hasheesh or tekhomei.

The leaves of this plant are sometimes fried in honey and butter to extract the active resinous portion, and this they eat, as we should, gum drops. The first smokers and eaters of hasheesh were called hasheeshins, from which our word "assassin" is derived, and the custom was first practised in the days of the Crusaders by a powerful enemy of theirs, "The Old Man of the Mountain," as he was called, and who obtained the most implicit obedience from many followers by supplying them with this drug.

The effect on the system is remarkable, and unlike that of opium, tobacco or alcohol. It immediately acts on the brain and nervous system, but does not stimulate the creative faculty, as does opium, and does not produce insensibility like alcohol, but while it allows its victim to be sensible to what is passing around, it intensifies sensations, and enlarges and expands to a most miraculous degree the objects by which the person under its influence is surrounded. Thus a few yards seems the stretch of a desert, and a tree is magnified into a forest, then comes short and pleasant dreams—the world ideal mingled with the world actual. Persons who are in the habit of using this drug usually terminate their existence as lunatics, and since the French have had Algeria their insane hospitals have been filled with the victims of hasheesh.

VELOCITY OF THE WIND.—When the wind moves at the rate of one mile an hour, it is hardly perceptible, at two miles an hour it fans us as the gentle zephyr, and at six it becomes a pleasant wind. From ten to twenty, it becomes high, and thirty to fifty characterize storms from light to hard; at eighty miles an hour it becomes a hurricane, and at 100 a tornado.

FISHER'S GOLD AMALGAMATOR.



Gold, as every one now-a-days is, we suppose, aware, occurs in the quartzose rock, in thin small veins, or in bright little rounded specks disseminated through the mass. Some of these grains, in fact, a great proportion, are scarcely visible to the naked eye, and they are often washed from the crushers with the waste gangue. We have hitherto had no perfect device for catching this part of the washed ore, and a great quantity of valuable amalgam has consequently been lost. The quartz is placed in boxes with mercury and crushed by heavy stamps, and the refuse quartz is washed away by a stream of water, in which some of the amalgam is also carried off. To prevent this, J. H. Fisher, of San Francisco, Cal., has invented the machine which is the subject of our illustration, so that by its means any amalgam that may be washed away from the stamps will be caught and saved.

This machine is placed in a frame, A, and consists of a large wheel, G, made of two rims connected by slats of metal, a, and supported on the shaft, L, by means of the hub, K, and radial arms. It may be rotated by a band wheel, M, or a crank. Inside this wheel is placed a cylinder, F, the periphery or surface of which is of silver, or some metal which easily amalgamates with mercury, and as the wheel, G, rotates, the cylinder, F, revolves slowly within it by the force of gravity. The washings are conducted from the stamps into a chute, C, which is provided with a grating, D, to prevent any large uncrushed pieces of quartz passing into the machine, and either damaging the face of the cylinder, or hindering the proper working of the parts. A movable flap, E, directs the washings on to the face of the cylinder, F, where the silver surface catches hold, as it were, of all pieces or globules of amalgam, and they join as part of its surface, the refuse passing away through the chute, H, and door, I.

The whole or part may be constructed of cast iron, and covered by a case, B, and the only expense is the first cost, as, when the amalgam is scraped off the surface of the cylinder, F, the silver can be recovered just as easily as the gold and mercury.

To the miner and mining appliances this is a valuable addition, as it will enable many rocks and auriferous sands to be worked which have before been unprofitable, and thus will serve to develop to a greater extent the gold resources of our country. There is no metal, if we except iron, which is so universally diffused as gold, and chemistry has demonstrated its existence in the most unlooked-for places—for instance, in sea water, and the human body. There are rocks almost everywhere containing not quite enough of the precious metal to be worked in the ordinary way, on account of the minuteness of the grains. With this machine, however, any sized grains, when once amalgamated, can be caught, and thus gold-mining be extended, while in the present mines it will effect a great saving, and considerably increase the profit of such operations.

It was patented February 2, 1858. Any further particulars can be obtained by addressing the inventor as above.

An Effective Turbine.

A turbine water wheel constructed by S. K. Baldwin, of Laconia, N. H., for a mill near Nashua, on a fall only 7.87 feet in height, gives out eighty per cent of its water power. This is the highest percentage known to us of power given out by a wheel on such a low fall. One of Mr. Boyden's at Nashua gives out eighty per cent, but it is 200-horse power, on a fall of 33 feet, whereas Baldwin's is only 13.4 horse power. Wheels on high falls should give out more power in proportion than those erected on low falls. An engraving of this wheel appeared on page 404, Vol. XII, SCIENTIFIC AMERICAN.

Domestic Recipes.

SCENTED OILS.—Some of these are sold by perfumers at a very high profit; they can all be prepared at a very small expense. Take a quart of common olive oil, and heat it in a stoneware vessel up to 212°, then add half an ounce of sal-soda, and stir all for fifteen minutes. Allow the oil to cool, and a sediment will fall to the bottom; pour off the clear, and scent it with any of the essential oils, such as rosemary, bergamot, and lavender. One-fourth of an ounce of essential oil will scent a quart of the prepared oil, which is very excellent for the hair, and equal to Rowland's celebrated Maccassar oil, sold at such extravagant prices.

LUCIFER MATCH COMPOSITION.—Take one ounce and a half of glue, one ounce of phosphorus, two and a half ounces of niter, one ounce and a quarter of red ochre, and half an ounce of smalt. Having carefully weighed out the ingredients, manipulate as follows:—First reduce the glue to a smooth jelly in warm water, the temperature of which is not to be above 145° Fah.; now add the phosphorus, and stir the mixture till the latter is perfectly divided into minute particles; then add the remaining materials, and mix them till the whole is one uniform paste. The composition must be kept warm, but never warmer than the thermometer heat above mentioned. Finally, the matches are to have their ends rubbed over a hot iron plate, and then dipped into the paste and left to dry in an airy situation. Some manufacturers use all smalt instead of the ochre; others use red lead in lieu of either. Private individuals cannot, of course, make matches, but every one should know the nature of common things.

ASTHMA PAPER.—Persons subject to attacks of spasmodic asthma will receive some relief during the paroxysms, by inhaling fumes given off from burning paper prepared with saltpeter. The paper should be loose and white, the same as that used for absorbing ink blots, and it should not contain any fibers of wool. Four ounces of saltpeter dissolved in a pint of water makes a solution of sufficient strength for the purpose. The paper is soaked in this for a few minutes, then taken out and dried thoroughly. It is then cut into pieces four inches square, and one or two pieces burned when required. Paper prepared in this manner gives out a considerable amount of free oxygen gas when it is burned. This has been tried by some of our friends with good effects.

FRAGRANT OIL.—Collect a quantity of the leaves of any flowers that have an agreeable fragrance; card thin layers of cotton, and dip into the finest sweet oil; sprinkle a small quantity of fine salt on the flowers, and lay first a layer of cotton and then a layer of flowers, until an earthenware vessel, or a wide-mouthed glass bottle, is full. Tie the top well over with a bladder, then place the vessel in a southern aspect, so that it may have the heat of the sun; and in fifteen days, when uncovered, a fragrant oil may be squeezed away from the whole mass.

ODORIFEROUS WATER.—Take essence of ambergris, 1 drachm; essence of musk, 1 drachm; essence of bergamot, 2 drachms oil of cloves, 20 drops; spirits of wine, 6 ounces; orange flower water, 4 ounces; distilled water, 4 ounces. Mix all together, and let them digest for a few days, at least a week, frequently shaking; then filter for use.

New Inventions.

Collision Preventer.

The latest new idea for preventing the sad effects of collisions on railroads is to have a track laid across the tops of the cars, with inclined tracks upon long cow-catchers placed at the front and rear of the train. The approaching train upon the same track, moving in whichever direction, instead of coming in collision, would run up the inclined tracks, pass safely over the tops of the cars that stood in the way and down upon the main track again, all in the twinkling of an eye. Mr. W. L. Pursall, of New York City, is the originator of the above happy contrivance.

Waterproof Transparent Photographs.

It is a well-known fact, says the London *Times*, that photographs on paper are, after a certain time, dimmed by a kind of colored film, which is sometimes formed on the surface, and sometimes in the texture of the paper itself. M. Gandinet, in a paper presented to the Academy of Sciences, obviates this inconvenience by rendering the paper waterproof before exposing it to the action of the sun. His process is as follows:—Having dissolved a certain quantity of gutta percha in benzole, the solution is decanted, after a few days' rest, to obtain it clear. Sheets of paper are then dipped into it, one by one, and immediately taken out again, and hung up by one of their corners to dry. These sheets are afterwards found to be covered with a kind of what may be termed powder of gutta percha, there not being sufficient adhesion to give it the quality of a varnish. To obtain this, the sheets are exposed to the action of a good fire, which makes the particles of gutta percha glue together, covering all the fibers of the paper, which thus becomes waterproof without losing its transparency. The paper then receives a solution of albumen (albumen, 100 parts; water, 25; chloride of sodium, 6), which is allowed to dry, and then rendered sensible to light by a solution of crystallized nitrate of silver of the strength of 15 per cent. The rest of the operation is quite the same as usual, only shorter, the photograph being fixed in a few minutes; the washing, which generally lasts from 12 to 24 hours, is reduced to a quarter of an hour. The photograph obtained is transparent, and the paper retains its former whiteness.

New Signal Lantern.

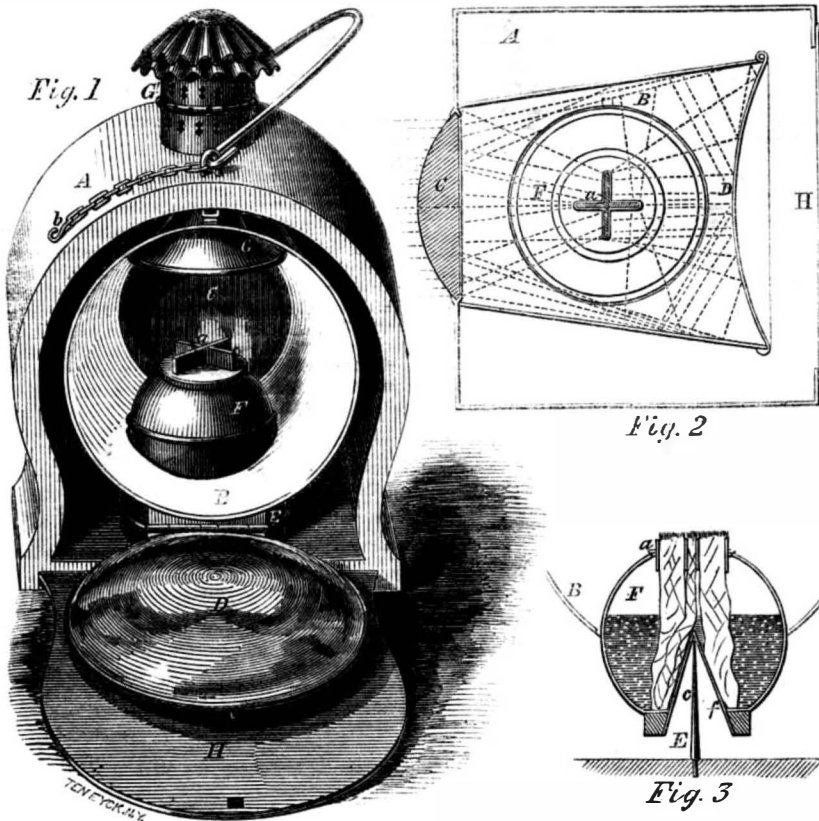
One of the most important requisites for a locomotive, steamboat or signal lantern is, that it shall throw the luminous rays emitted by the lamp to a great distance, and it has been found that the more concentrated these rays are the further they are visible. It is therefore highly desirable that a lantern should be constructed, which, instead of diffusing the light, would throw a column or bundle of rays in a concentrated form, and thus penetrate the surrounding darkness for a great distance. By the arrangement of reflectors in the subject of our engraving, such a concentration is effected, and we will now proceed to describe this lantern, the invention of Wm. Howard, Flushing, L. I.

Fig. 1 is a perspective view of the device, with the door and back reflector open to show the interior.

A is an ordinary lantern, inside which is a conical shaped reflector, B, having at its narrowest end a plano-convex lens, C, and at its broadest part a convex reflector, D, which can open and shut as a door to light the lamp. This reflector is supported on a perforated stand, E, through the center of which rises a pin, c (Fig. 3, which is a section of the lamp), and on this is supported the lamp, F, by a hollow cone, f, so that it can swing, and always maintain its perpendicular in any position of the lantern, and also obviates the necessity of gimbal rings, which are generally employed for the same purpose, but as they

obstruct the light of the lamp passing to the lens, they are objectionable. The lamp passes through a hole in the reflector, B, through which there is also room to admit air to feed the lamp whose wick tube, a, is placed in the form of a cross in order that a great amount of light may be obtained from a small lamp.

HOWARD'S SIGNAL LANTERN.



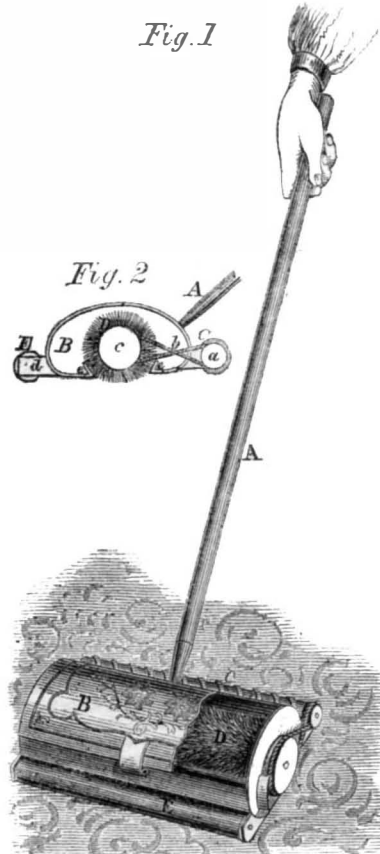
its conformation, collects the rays of light from the lamp, and throws them in a very condensed form upon the lens which sends them forth in all their intensity and brightness to illumine the darkness for a great distance.

This form of reflector is entirely new, and has been found to give a very superior light

The products of combustion pass through a funnel, G, to a chimney, G', and all the parts inside which the light touches are plated. The door of the lantern, H, is kept closed by a chain and hook, b. Fig. 2 is an horizontal section of the lantern above the lamp and shows the shape of the reflector, which, from

to any of the signal lanterns now in use, far exceeding them in the distance which it can be seen by an observer, rendering it therefore especially applicable for all uses where this is the purpose of the light. It was patented June 2, 1858, and any further particulars can be obtained by addressing the inventor and patentee, W. E. Howard, as above.

Shaler's Carpet Sweeper.



A pleasant feature in the character of man is the love of home, and it is creditable to the genius of inventors that while the steam engine and electric telegraphs have engaged their attention, home wants have not been forgotten. We have an illustration of this in the invention we are about to describe—a carpet sweeper—which substitutes an elegant

little contrivance requiring no more labor than a few walks up and down the room for what is now, a laborious dusty operation.

Fig. 1 is a perspective view, and Fig. 2 a section of the device, which is the invention of R. Shaler, of Madison, Conn., and was patented by him Sept. 7, 1858.

A handle, A, has a box, B, attached to its lower end; at the rear of the box and parallel with it is placed a roller, C, with a band of rubber run spirally around it. On the end of C is a small pulley, a, around which an endless band passes, connecting it to another larger pulley, c, on the shaft of a circular brush, D, in the box, B; there is also a roller, E, in front of the box, and connected with it by means of its bearings, d, similarly to the bearings of C. The box has a hinged top, so that the dust can be removed from it, and it is turned back as seen at e to prevent the dust escaping when brought in by the brush.

The operation is simple and perfect. The box is placed on the carpet, and moves either backward or forward, it matters not which, the rubber spiral "bites" on the carpet and the roller is rotated, and by the endless band and pulleys it rotates the brush, the bristles of which entering into the pile of the carpet give it a thorough brushing and deposits the dust, pieces of paper or bits, in the box without raising the cloud of dust that is the usual accompaniment of carpet sweeping.

To the excellence of this device we can personally testify, and we have no doubt that it will be hailed with gladness by many a housekeeper as one of the most useful additions to home labor-saving machines that has yet been made.

Any information concerning the invention can be obtained by addressing Shaler's Patent Carpet Sweeper Company, 69 Fulton street, New York.

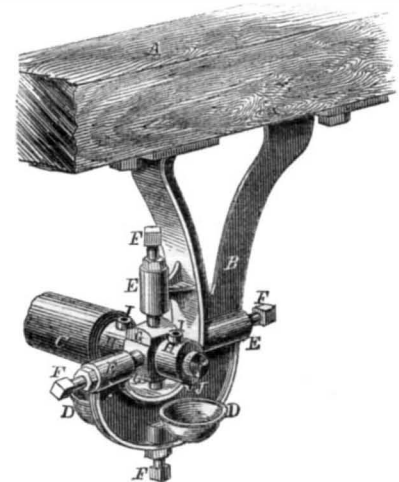
Tallow Candles.

Palmer's tallow candles, which require no snuffing, are made in England, and not in this country, so far as we know. One-third of the wick is first impregnated with sub-nitrate of bismuth ground up with oil, the whole is then bound round in the manner called "gimping;" one, two, or more of these wicks are wound round a thin rod in a spiral manner, and placed in the center of the mold, which is then filled with tallow, and when the tallow cools, the rod is withdrawn. On burning these candles the wicks uncurl, and form so many separate flames, and the ends coming into contact with the air at the edge of the flame, are consumed.

Johnson's Adjustable Hanger for Shafting.

The shafting of mills has to be supported in close contiguity with the roof, and often, from its great length, it is subject to vibration, the result of its rapid motion, which throws it somewhat out of a true right line, and if its journal box be rigid, it becomes soon uneven, and wears the shaft itself quickly; in fact, the use of rigid hanging bearings is attended by so many inconveniences that a remedy in the shape of an adjustable hanger has long been wanted.

The subject of our illustration is an adjustable hanger constructed on the principle of the universal joint, which allows and accommodates any of the positions which a shaft may take in its vibration; always keeping the bearing in a right line with the shaft, thus diminishing friction, and also affording support to a shaft passing through it at any angle. The following description will explain the invention:—A is a roof, beam or any piece to which the hanger, B, can be secured. C is the shaft passing through the box, H, which has two holes, I, in it, for the purposes of lubrication and the oil which leaks from the box is directed by a lip, J, into the cups, D,



cast with the hanger, so that there is no dripping of the oil. The box is rounded at the exterior of its surface, G, and these rounded surfaces are placed with the curves of the two sides, at right angles with the top and bottom, and the box is supported by screw pins, F, passing through collars or extended nuts, E, which press against the curved faces of the box. By screwing these tight, it can be made rigid and fixed, and by slightly loosening them the box is allowed free play in all directions, thus making it a perfect self-adjusting bearing, suitable for all cases where a shaft has to be supported from the roof of the building or room in which the power is required.

It is the invention of William Johnson, of Lambertville, N. J., who will be happy to afford any further information concerning the device. It was patented June 15, 1858, and one of them was on exhibition at the Crystal Palace at the time of its destruction.

CORRECTION.—On page 40 of the present volume of the *SCIENTIFIC AMERICAN*, in our description of Hawley's Rotative Planter, we make Mr. R. N. Hawley reside at New Haven, Conn. This is a mistake, as his abode is at Hawleyville in the same State, and the date of the patent is 1858 not 1857.

Scientific American.

NEW YORK, OCTOBER 23, 1858.

The Preservation of Life at Sea.

In our last issue, we directed attention to the important subject of "Fires on Land and Sea," and discussed the inquiry, "What can be done to suppress them?" We now wish to direct attention to some of the agencies that may and ought to be employed in the saving of life in all future cases of marine disaster.

The first and main consideration for the safety of life at sea should be the proper construction and management of the ship itself; it is always a desperate resort when other means of safety are required, nevertheless all experience justifies the necessity and wisdom of providing for every possible contingency. We are confident that there is not a single vessel navigating river, lake or sea, at the present moment, which is amply provided with well-known safety apparatus; indeed, it is a startling fact that our very best steamers are sadly deficient in such equipments. Take the case of the steamship *City of Baltimore*, on her recent voyage. While coming up New York bay, a man was blown overboard by the premature discharge of a cannon while firing a salute, and so defective were the arrangements for lowering the life-boat that ten minutes elapsed before this was effected, during which period the unfortunate gunner had floated a mile to the stern, and was afterwards taken up dead. During these ten minutes of suspense, when twenty men were fumbling at the boat, not a life-buoy could be found to throw overboard. The same incompleteness of arrangements characterize nearly all of what are called "crack steamers." A great number of safety devices can be provided for every vessel, not one of which should be omitted in any case. Thus, every mattress may be rendered an effective life-preserver; an illustration of one will be found on page 284, Vol. IV. of the SCIENTIFIC AMERICAN. We have seen one of them employed as a boat, and it answered a good purpose. Any common mattress, if enveloped in india-rubber cloth, will float one or two persons in the water. Besides this, patents have been secured for constructing tables, chairs, stools, berths, doors, partitions and buckets of ships, so as to render them effective life-preservers; some of these articles being convertible into rafts, capable of saving a large number of passengers.

But while we urge these considerations upon the owners of vessels, we would fail in our duty did we not as strongly press the matter upon the attention of every person who intends taking a voyage to sea, or a journey upon our rivers and lakes. Passengers should also provide some means of safety for themselves; and among the great variety of articles which have been invented—we are always compelled to acknowledge the inventor—are valises made of india-rubber or oil-cloth, and provided with cells capable of being inflated. Coats, hats, vests, pantaloons, shirts, bands, all curiously contrived with air tubes or bags, ready in a moment to do all possible service in sustaining the unfortunate one who but for these appliances would speedily sink to rise no more. Among all these the india-rubber dress described on page 34, Vol. IV. of the SCIENTIFIC AMERICAN, is perhaps the most effective.

Let any one go on board of even the best regulated steam and sailing vessels used in the transportation of precious human freight, and inspect critically the probable chances of escape in case of fire or shipwreck, and we are satisfied a conviction of "false security" will be clearly manifest. Nothing comparatively is done in a practical way to meet danger until its horrid realities stare the imperiled ones in the face. Is it possible that owners and commanders of vessels will still go on regard-

less of such provisions as are required to meet emergencies? Is it possible that passengers will not profit by the suggestions herein made? Shall we not profit by the bitter and agonizing experience which comes home to our hearts in the tales of horror and distress of those passengers on the ill-fated *Austria*? If owners of vessels will so neglect their duties, the government ought to take the matter in hand, and enforce some stringent measures that will compel them to adopt all needed life-preserving agencies.

We are happy to state the fact that forty-two more passengers saved from the burned steamship *Austria*, arrived at this port on the 14th inst., in the British war steamer *Valorous*, from Fayal, where they had been taken by the French brig *Maurice*.

Glass Grinding and Polishing.—Another Triumph of American Inventors.

In 1854, Albert Broughton, of Malone, Franklin co., N. Y., obtained Letters Patent of the United States for a machine designed for polishing stone, and it occurred to the practical mind of Albert Lindsay, of the same place, that the same machine would answer a good purpose for polishing glass, and upon applying it for this purpose it succeeded beyond their most sanguine expectations. This result induced Messrs. Lindsay & Broughton to take measures to secure foreign patents, and in 1856, Mr. Lindsay visited England and France, for the purpose of bringing this important invention before the plate glass manufacturers. It arrested the attention of the celebrated British Plate Glass Co., at St. Helen's—the oldest, and one of the wealthiest concerns in England. Its operation at a specific trial was so satisfactory, that it led to the purchase of the right for a very large sum. But this machine was only adapted to small plates; and soon after Mr. Lindsay's return home, he devoted himself to render it efficient for larger plates. In this he was successful; and in July last he re-visited Europe, and according to the provisions of a contract stipulating for any subsequent improvement that might be made, he tendered the improvement to the company. Its operations have given so much satisfaction that it is intended to supersede the whole of the glass-grinding machinery in use. Previous to the introduction of this machine, the company referred to employed one hundred hands in polishing, and now require but ten; and instead of 2,500 pounds of emery per week, costing from \$90 to \$100, only 500 pounds are now required to perform the same amount of work.

Who could have imagined that a machine invented away up in Malone, N. Y., would one day revolutionize the entire art of grinding and polishing glass in England? This is one of the many instances of the success of American inventions abroad, to the benefit of both parties—the patentees and assignees. The patent secured for Messrs. Lindsay & Broughton through our agency, received a thorough legal investigation before the company would take it, thus showing the vast importance of the utmost care and experience in the management of foreign patent cases.

Messrs. Lindsay & Broughton, in a letter addressed to us on the 12th inst., state that their inventions have been very valuable to them, and allude, in terms of grateful approbation, to our success in the management of their American and European cases. It is probable they will realize more than \$100,000 from their European patents alone. How vastly important then that all inventors who design to take out British patents should intrust their cases to agents of known integrity and responsibility.

METEOR.—A remarkable meteor, apparently one-third the size of the moon, was observed at the Toronto Magnetic Observatory a few evenings since. Its form was pear-shaped, and it burst when at an elevation of twelve degrees above the horizon.

The Leviathan Steamship.

This giant of the seas, which has caused so much speculation, expense, and anxiety, has been in a stand-still condition for some time. It was expected at one period that she would be all ready for sea this autumn, and that the first voyage would be taken to some American port, probably Portland, Me., but at present it is not possible to predict when she will be ready, or what will be her future destination. The cost for her construction having far exceeded the original estimates, and all the funds having been used up, the stockholders did not feel inclined to increase their contributions, hence the delay in completing this great steamer. It is now proposed to form a new company, with a capital sufficient to purchase out the old one, and to finish her at an early date. It is stated that, when completed, she will be able to make eight voyages per annum between London and Portland, and pay a handsome profit.

Rumors have also been circulated that the Emperor of France wishes to purchase the *Great Eastern* for his navy, and some fears are entertained in England that he may accomplish his object. It has been urged upon the British government to step in and make the purchase for the royal navy. Louis Napoleon is a long-headed genius, and if he can secure the *Great Eastern*, he might laugh at the power of the whole British navy, because this monster steamer could run down the whole of the largest steamers in any other fleet, one after another, without firing a single shot. We hope that some energetic measures will soon be carried out to complete this noble steamer. The results of such a grand experiment will be looked for with anxiety and interest.

New Cigar Boat.

We have recently received more information respecting the curious steamer now being completed at Baltimore, Md., by Messrs. Winans, the distinguished locomotive engineers. The hull is of the form of an immense cigar, 180 feet long, and 16 feet in diameter, without keel or flat deck, and is built very strong, for the purpose of being driven through the waves. She is to have neither masts nor spars, and the only thing to be visible above deck is the smoke-stack and ventilator. She is to have four high-pressure locomotive engines, which are to drive a propeller amidships. Every part of the vessel is to be of iron, well braced, and so divided into water-tight compartments as to be a life-preserver. It is expected to be ready in six weeks, and to make her first trip to this city, thence to Liverpool. We remember a steamboat that was built by Mr. Burden, in 1837 or '38, in Troy, N. Y., having two huge cigars for the hull, and the decks situated above these. It was expected to run very fast, but we believe it made but one trip, and was stranded on some of the flats up the Hudson river. Messrs. Winans' steamer is undoubtedly different in principle, but from its form it must roll awfully in a heavy sea. It is a mistake to suppose that it will sail through the waves smoothly. We think it will be perfectly unmanageable.

Pacific Stage Route.

Overland regular mail communication has been established between St. Louis and San Francisco. The first mail arrived on the 9th inst. in twenty-three days from the shores of Pacific, and it was the occasion of general rejoicings in St. Louis. In answer to a telegraphic message announcing the result, President Buchanan says:—"It is a glorious triumph for civilization and the Union. Settlements will soon follow the course of the road, and the East and the West will be bound together by a chain of living Americans which can never be broken."

The electricians are entirely at a loss to account for the stoppage of the Atlantic cable, and much anxiety is manifested concerning it both here and in England.

The American Institute and its Exhibitors.

Since the destruction of the Crystal Palace, and the consequent abrupt termination of the Fair of the American Institute, by which the hopes and expectations of many worthy inventors and exhibitors have been blasted, a bitter opposition has sprung up against the Managers of the Institute on the part of the exhibitors, which has led to several spirited meetings of the latter, with a view to an independent organization, and, if possible, the opening of another Fair, this season. Several prominent citizens and inventors have become identified with the movement, and, if we can "take the will for the deed," something is likely to come out of it.

It was our intention to have made some more extended remarks in reference to the above subject; but at the time of our going to press, no definite announcement had been published. We are apprehensive, however, that, owing to the lateness of the season, and the fact that, out of the three thousand exhibitors, comparatively only a few are participants in this new movement, no other Fair will be held this year.

Nickel and Iron.

From the observation of the fact that meteoric iron is possessed of greater hardness and tenacity than the ordinary iron, it was thought by W. Fairbairn, F.R.S., that this property was due to the presence of nickel, which is found in all meteorolites. He has, therefore, recently been trying some experiments to test the fact. The nickel was combined with the iron in the same proportion as analysis had demonstrated that it had existed in a stone which had dropped from the clouds, and it was found that instead of increasing, it decreased the strength of the cast iron 17 per cent. He concludes his account of the experiments by remarking that he had conceived the idea that such an alloy would be most excellently adapted for large cannon and mortars, but that to resist the action of gunpowder there is nothing so good as the best and purest cast iron, and the more free from sulphur, phosphorus, or alloys, the better will it resist the violence of the explosion. The effect of nickel with malleable iron would, however, be as Mr. Fairbairn expected, namely, an increase of toughness, for carbon, phosphorus, and sulphur, which so much deteriorate the quality of cast iron, in small quantities improve that of malleable, and it is not at all improbable that nickel would have the same effect. Some of our American iron men should try the experiment and publish the result, as it would be an interesting addition to our knowledge of iron.

Buckwheat as Food.

M. Isidore Pierre has recently been making some investigations on buckwheat, from which we condense the following interesting results:—Buckwheat cakes are equal to pure white bread as regards the phosphates or bone-making material, and nitrogenous principles which they contain, and are superior to bread in fatty matters. The general yield of buckwheat when cooked is about three times the weight of the flour used, showing that such flour will retain forty to forty-one per cent of water. Between different batches of ground buckwheat there is a great dissimilarity of composition—one batch containing nearly seven times as much nitrogen, twenty-five times the amount of phosphates, and a hundred and fifteen times as much fatty matter, as another. The bran is the richest portion of the buckwheat, but cannot be digested by weak stomachs. The finest qualities of buckwheat flour, and the white mill dust especially, are very suitable for children and persons in delicate health, while the coarser varieties require a strong stomach and much exercise for their perfect digestion.

We are indebted to Mr. J. F. Feeks, California news-agent, No. 18 Ann street, this city, for prompt delivery of files of papers from the Golden State.

The Atlantic Cable and Telegraph Conductors.

Messrs. Editors—It would be convenient to have some definite unit of electric resistance as a universal standard. Some physicists have proposed for this standard a round wire of pure copper one meter in length, and one millimeter in diameter. The meter is a French measure a little longer than our yardstick—about 39.38 inches—and the millimeter is equal to the thousandth part of a foot—0.03938 inches. We may correctly assert that the resistance which such a wire offers to the passage of an electric current is equal to unity. If R denotes the resistance of the wire, we express its value thus, $R=1$. Several other standards have been proposed and employed in different investigations, but for our purpose it may be more convenient to employ as a standard unit of resistance, one mile of No. 9 iron wire—this wire being in most common use for telegraph purposes. Our unit then will be 5280×0.148 inches (the diameter) of Washburn's best telegraph wire. It will be necessary for us to ascertain how to compare one unit with another, and also one conductor with another. It has been ascertained that the resistance which a body opposes to the passage of a uniform current of electricity is directly proportional to its length, to its specific resistance, and inversely to the magnitude of its cross section. Hence if l denote the length of a conductor, s its specific resistance (that of copper being unity), and c the area of its cross section, its resistance may be expressed thus: $R=l \div s \div c$. We will consider lengths l , expressed in feet, and diameters, D , to represent inches. To compare the iron unit with the copper unit, let us designate by R the total resistance offered by the copper standard, and by R' that offered by the iron. Let l be the length of the copper in feet= $3 \cdot 28$; and l' that of the iron= 5280 ; $s=1$ the specific resistance of copper; and $s'=5 \cdot 625$, that of iron; $D=0.03938$ inches, the diameter of the copper, and $D'=1.48$ inches, the diameter of the iron. Then the expressions $R=l \div s \div D^2$, and $R'=l' \div s' \div D'^2$ will represent the resistances of the two conductors—the one a copper, and the other an iron wire. The expressions $R' \div R$ will also show how many times the copper unit is contained in the iron. It is equal to $l' \div s' \div D'^2 \times D^2 \div l \div s$, or in numbers thus: $(5280 \times 5.625 \times 0.00155) \div (0.21904 \times 3.28 \times 1) = 640.75$ the number of times the copper unit is contained in the iron one. This amounts to saying that one mile of No. 9 iron wire offers as much resistance to the passage of an electric current as do 641 meters of No. 19 copper wire.

We will now endeavor to obtain some idea of the length of the Atlantic Cable, and the resistance which it offers to the passage of an electric current, as measured by our iron unit of one mile of No. 9 wire. The length of cable actually laid is about 2,333 miles, or 12,318,240 feet. The diameter of each of the seven conducting wires in the cable is 0.293 inches. By calculation it appears that 5,280 feet (one mile) of our overland telegraph conductors offers as much resistance to the passage of the electric current as 8,150 feet of the copper conductor of the Atlantic Cable. As the 12,318,240 feet in the cable conductor contains 8,150 about 1,510 times, the total resistance in the cable wire of 2,333 miles is only equal to that in 1,510 miles of a land line. Were it not for the phenomena of retardation by lateral induction in the cable, we might be able to work through it with a battery for 1,510 miles on land, and even with less than this, if the insulation of the cable were better. 100 cups or pairs of Smee's battery suffice to work from Boston to New York (200 miles); therefore a battery of 600 cups should work through the cable. It was found, however, that 240 cups transmitted signals perfectly through the cable while it was being paid out, thus proving that its insulation at that period was superior to that of land lines, or that the indicating instruments employed

were more sensitive than those in common use.

When the line of telegraph was first opened from Burlington, Vt., to Boston, Mass., signals were distinctly received from a sand battery of 36 pairs of plates, which would be equal to about 194 pairs for the cable. Signals have been received in Boston from Calais, Me., with even a less amount of battery force than 36 pairs of plates. The circuit of the cable is completed by connecting the instruments at each end with the earth. The usual way to do this is to attach a wire to a plate of copper, and bury it in the ground. This might also be accomplished by making a connection from the instruments to the sheathing of the cable, which is composed of 126 No. 21 iron wires wound spirally. These wires offer themselves as a conductor, and so does the salt water of the ocean. In comparing the resistance of this sheathing with No. 9 iron wire, it would be equal, for completing the circuit, to 418 miles of a land line. But even if we assume the specific resistance of the sea water to be 25,000,000 (pure water would be 79,000,000), and the average depth two miles, its total resistance will only be equal to 58 feet of No. 9 iron wire. It is, therefore, easy to conclude that the electric circuit is completed through the earth and sea, and that in this respect no advantage would be secured by having, as some have proposed, a separate wire to complete the circuit. * * *

Boston, Mass., October, 1858.

The Patent Office Building.

During the past two or three months, says the Washington Union, great changes have been taking place, both in this building itself and its contents. The north wing is steadily progressing, being now up to the third story, and built in a most substantial manner. The exterior wall on G street is of marble, while the rear one is of granite. The west wing is occupied, in the first and second stories, by the clerks of the General Land Office; and there not being accommodations sufficient for them, the rooms heretofore occupied by the rejected models belonging to the Patent Office have been emptied of their contents, and are now being cleaned up and fitted for the use of the Land Office. Those rejected models have been carried up stairs and placed in the cases which were formerly filled with the curiosities brought home by the exploring expedition, &c.—the latter having been removed to the Smithsonian Institution. But these cases are inadequate to contain this vast multitude of rejected models; and besides being filled to repletion, a large number are piled in heaps on the tops of the cases, and still the number increases. The inventive genius of our countrymen grows more and more prolific, and in spite of the large number of patents which are issued weekly, a great many applications are weekly rejected. The hall in the west wing is now in course of preparation to receive rejected models. There are nearly a hundred cases erected, of large size, and capable of holding many thousands of models, and this hall, which extends the whole length of the wing, will be exclusively devoted to the proper arrangement and exhibition of these models. While they were in the basement they could only be seen with great difficulty, as it was dark, and they were piled together indiscriminately, and the dampness of the place was also unfavorable to their preservation; but now they may be seen to better advantage, and an hour or two may be pleasantly and profitably spent in this manner. Among these models are patterns of all sorts of machinery; beehives of a great variety of shapes; churns, cider-mills and cheese presses; rat traps, by which the Examiners were not to be caught; pistols, pumps and paddle wheels; stoves, steam boilers and steering apparatus of every description; improvements in household furniture and in coffins, in bridges, fences, and gates, in steam engines and water filters. In one case may be seen all the varieties of lamps

and lanterns that would seem capable of being devised by human ingenuity; and in another are galvanic batteries and magnetic telegraphs, calculating machines, an instrument for indicating the depth of water, a self-adjusting climater, and a self-adjusting quadrant. It is almost painful to think of the many weary hours of toil and sleepless nights of study to which this mass of inventions owed its parentage; and all for nought. They were weighed and found wanting; they would not stand the test, and were thrown among the rubbish in the basement of this building, to be at this late day brought to light and to furnish food for reflection to thinking men. Some of these models which we observed bore the date of 1838, having been in the office for twenty years, but the greater part have been collected within the last four or five years.

Among the other curiosities in this gallery is a case of Chinese models from Hong Kong, consisting of mills, water wheels, plows and harrows, and presented by Lieut. Gillis, of the United States navy. There is an appropriateness in placing them here, for we do not believe a patent could be obtained for any of them, and they therefore belong among the rejected models.

Another case contains a town clock, made by the late Wm. Voss, of Washington. This is a beautiful piece of machinery; and can be placed upon any tower or building intended for such a purpose, and made to strike the hours or quarter hours (if desired) on a bell so as to be heard all over the city. The nature of the works will admit of from one to four dials, and will show the hour upon all of them. The price of this clock is eight hundred dollars. We have often heard the complaint that there is no town clock in Washington. Let this be said no longer, for there is one, and it is to be found among the rejected models. There it stands, mute and motionless, yet how suggestive. Another model, the first one which strikes the eye of the visitor on entering the hall, is that of the Washington monument. This also suggests a train of thought, which we will leave our readers to follow out.

Plowing by Steam.

The "iron horse" seems to be gradually claiming the attention of farmers, for the purpose of tilling the soil. The State Board of Agriculture in Illinois has offered a premium of \$5,000, for the best steam plow; and a trial for this prize is to take place at Grand Prairie, some time this month. Three plows are entered for competition, and one has already made its appearance in the Prairie State. This is that of Mr. Wm. Fawks, of Christiana, Pa., built on the locomotive principle, and capable of turning six deep furrows at one operation. It was tried at the State Fair, held at Centralia (Ill.), on the 16th ult., and gave very general satisfaction.

The Royal Agricultural Society of England has recently awarded a prize of \$2,500 to Mr. H. Fowler, for the most efficient steam plow. It has a stationary engine, using warping ropes to drag the shares through the furrows. Mr. Mechi, the celebrated English farmer, uses one of these plows; and its cultivation of the soil is very superior—the yield of wheat having been increased eight bushels per acre by its use. There are twenty tenant farmers in England who now cultivate with steam, and the saving is about one-fourth of the cost, in comparison with horses. Where fuel is abundant and cheap, we have no doubt that in twenty years hence, steam plows will be in common use in our great Western prairies.

Messrs. Newall & Co., of London, have taken a contract with the Turkish Government for laying down a telegraphic cable between Cape Hellas and Alexandria. By this cable England will be brought in immediate telegraphic communication with the latter city, from which a land line is to be laid to Aden, and carried through the Red Sea and Persian Gulf to India.



* PERSONS who write to us, expecting replies through this column, and those who may desire to make contributions to it of brief interesting facts, must always observe the strict rule, viz., to furnish their names, otherwise we cannot place confidence in their communications.

J. K. S., of Crooked Hill.—The mineral you sent us to examine is iron ore. It would make a very good paint, or might pay well for smelting. This, however, would depend on contingencies upon which we can venture no advice.

R. G. C., of Ky.—We are well aware that when atmospheric air is mixed with common coal gas, it depreciates its brilliancy when burning. An equal volume of air reduces its luminosity one-half. But this is not due, as you suppose, to the nitrogen of the air combining with the hydrogen of the gas, as nitrogen is perfectly inert. The cause of this is due to a greater quantity of oxygen being supplied to the carbon and hydrogen of the gas, whereby their combustion takes place simultaneously, thus preventing the solid particles of carbon from reflecting the light. This accounts for gas mixed with air giving out more heat than when burned in the common method.

G. H. T., of Mass.—Some self-sealing air-tight cans do not require to be soldered. Their lids, when screwed down, are air-tight.

T. A. D., of Mo.—An electrical machine cannot be made to draw off the induced electricity in the Atlantic Cable any faster than a common telegraph apparatus.

ADHESION.—The adhesion between the surface of water and any body resting upon it may be easily measured; and it has been found that a plate of copper having an area of seven inches requires 1,000 grains over its own weight to raise it, or overcome the adhesion of the water.

T. M. C., of Me.—Your fall of water is eight feet, and the area of the discharge opening is a square foot, therefore the water power will be nearly 16-horse; but as you use an inclined penstock 60 rods in length, we would allow about one per cent less for its friction. This you will find to be about the ratio, if the penstock is smooth inside.

BAD COMPANY is like a nail driven into a post, which, after the first or second blow, may be drawn out with little difficulty; but being once driven up to the head, the pinners cannot take hold to draw it out; it can only be done by the destruction of the wood.

CARPET LININGS are now very much used for the purpose of protecting the fabric from being rapidly worn out by contact with seams and rough places in floors. By its use also the most common carpets are made to feel as soft to the tread of the foot as the Royal Wilton. J. R. Harrington has secured patents for placing a layer of cotton batting between two sheets of paper, and has disposed of his interest in the manufacture of the article to the New York Carpet Lining Co., No. 443 Water street, New York. Having tested the article we can speak well of it.

W. L. P., of N. Y.—Your collision-preventer will be noticed in another part of our paper. It is a bran new idea. It is amusing in theory, but totally impracticable.

LAONIC.—Upon the 19th of May, 1790, the memorable dark day, a lady wrote to Dr. Byles as follows:—"Dear Doctor, how do you account for this darkness?" He replied, "Dear Madam, I am as much in the dark as you are."

E. J. S., of N. Y.—We are well aware of the extraordinary luminous effect produced by Hick's cap for gas burners, but cannot satisfy ourselves as to the cause of its superior results.

C. C., of Boston.—A good white varnish, suitable for maps, &c., or paper, is prepared thus:—Gum sandrac, 8 ounces; mastic, 2 ounces; Canada balsam, 4 ounces; alcohol, 1 quart. Dissolve in a gentle heat, or in a water bath. In a few days decant the clear. The maps, &c., should have a coat or two of size made from isinglass, or cuttings of parchment.

INQUIRE, of N. Y.—You are perfectly correct in saying that if you raise a pendulum from its state of rest and let it fall, it will continue to move forever, if the resistance of the air and friction be removed. The reply of the editor of the Mercury does not touch the point, although it is a matter of no account, since the subject is one void of any practical results.

G. B. & Co., of Ohio.—You will find a small clock illustrated and described on page 340, Vol. XII, Soc. AM. It will answer your purpose, we think, for centering small rods. Address Wm. Stephens, Richmond, Ind.

PEDDLER.—You must conform to the laws of the States in which you wish to sell your wares. Most States grant licenses to peddlers for a consideration. The fact of your commodity being a patented article does not protect you in violating the laws of the State.

H. D. F., of Mass.—By arranging the conducting wire of a submarine cable in the form of a helix, you will increase the induction and resistance—the greatest evils connected with ocean telegraphing. This fact you will do well to bear in mind.

A BUSINESS SUGGESTION.—A correspondent, writing from the good city of Boston, wonders why inventors and patentees whose machines are illustrated in the SCIENTIFIC AMERICAN do not take pains to have the prices of their machines stated. Many persons, he thinks, who see an article they would like, let it sleep entirely, because they have no idea of the cost. He says English advertisements always state prices, and that there are advantages in it. We agree with our correspondent's suggestion, and shall be glad to perform our part of this service. We have suggested it

Science and Art.

Allen's Washing Machine.

The washing machine is daily becoming a more distinct feature of our country's inventions, and no sooner has one invention seemed to bar up all further improvement than another is invented which as far surpasses its predecessor as that did its forerunner. The portable and convenient machine which forms the subject of our illustrations is an example of this progress of invention, as will be seen from our description.

Fig. 1 is a perspective view of the washing machine, and Fig. 2 a view of the washing board and bottom of the tub.

A is an ordinary washing tub secured to a stool or stand, C, which raises it the required height from the ground, to be used without causing the person washing, to assume any unnatural or unhealthy position. The bottom of the tub, F, is covered with a series of semi-circular pieces, *a*, arranged as shown in

Fig. 1

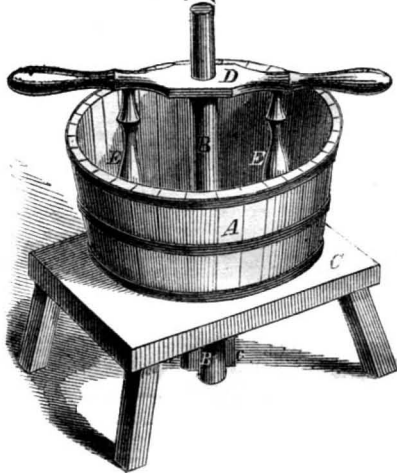
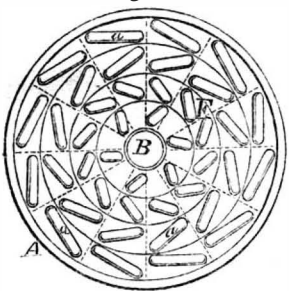


Fig. 2, their ends are rounded, and they form artificial knuckles upon which the clothes are rubbed by a plate provided with similar pieces only arranged in the reverse position, thus ensuring the perfect rubbing of all parts of the fabric between them, and consequently its thorough cleansing from all dirt and impurities. The bottom of the tub has a shaft, B, passed through its center, and this also passing through the stool, C, enables the tub to be secured to the stand by a small wedge, *c*, passing through it underneath the stand.

Fig. 2



The rubber is attached by two arms, E, to the crosspiece and handles, D, and the clothes being placed in the tub with the necessary quantity of soap and water, the rubber and handles are slid over the shaft or central piece, and the proper motion being given the rubber by the operator, the clothes will be quickly and thoroughly washed.

This compact and neat machine is the invention of the Rev. John Allen, of Galena, Md., who patented it Sept. 14, 1858. The inventor, or Edwin Allen, 408 Broad street, Newark, N. J., may be addressed for further information.

Transparent Enamel Photographs.

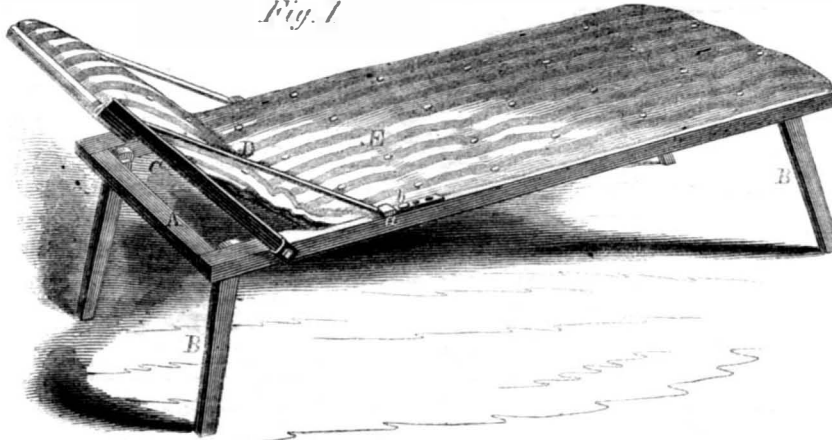
A novel and elegant adaptation of the photographic art has recently been brought out in London, and termed transparent enamel photographs. Transparency is attained by fixing sheets of enamel upon glass surfaces, the two forming one plate. Upon one enamel face the picture is taken, the surface having

been rendered sensitive by the ordinary process. Then, when inverted, the glass becomes a ready-made protection for the pictures on one side, and another sheet of glass may be placed at the back or not at pleasure. The enamel surface will also take water colors, and when thus painted, the effect is scarcely inferior to that of ivory. These colors are af-

terwards fixed by a peculiar process. The advantages thus secured are transparency, capability of being perfectly cleansed, and, as it is confidently stated, durability of colors. The purity and delicacy of the result may be well imagined, and will doubtless bring the discovery into use for ornamental windows, lamp-shades, and all other transparencies.

FAVOR'S INVALID CHAIR AND BED.

Fig. 1



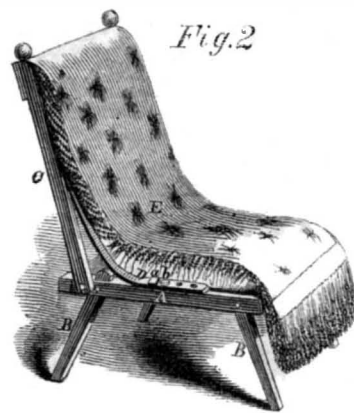
Among "the ills which flesh is heir to," there are very many, the radical cure of which is only to be effected by rest. The poet has called it "Nature's sweet restorer," and sleep, the acme of all rest, Shakespeare has defined as "Nature's soft nurse." So we have poetic as well as medical authority for making the assertion. When in a state of health a man can sleep anywhere and on anything, if tired; some can even fall into the "arms of Morpheus" leaning against a tree, and others court the "drowsy god" under the benign shade of a stone wall. But when sickness has wasted the "human form divine," and weak inanition preys upon the mind and body of a poor sufferer, some truly comfortable and simple device must be had recourse to, in order that a change of position may be easily effected without disturbing the patient. This device should be cheap, portable, and simple, and such a one is found in the subject of our engravings.

Fig. 1 represents an invalid bed, which is also suitable for the camp or the emigrant. A rectangular frame, A, is supported by four short but strong legs, B, which are secured to A by a pin, and they can be folded inside, or kept firmly in the position shown by a small catch. The head-board, C, is pivoted to the frame, and the sacking or mattress, E, is attached to its top rail, so that the elevation of the head-board forms a pillow of any height, thus raising the body to that angle at which the person can secure the most rest, or at which the greatest comfort is obtained.

The proper angle of the head-board is arranged by having it supported by two straps or cords, D, attached to its upper end, one on each side. The other end of these cords or straps has a metal strip secured to it, and this strip is perforated by a number of holes, which, passing over a stud, *b*, in the frame, A, hold the head-board in any desired position. The strap passes also through a guide, *a*, to

hold it in the proper line. The sacking can be attached by ropes and slats, or by ropes alone, or nailed to the frame, as may be most convenient, and it forms one of the best invalid couches which we have ever seen.

The chair, which can also be made into a couch, and is for the invalid a truly easy chair, is represented in Fig. 2; and it will be seen at a glance that its construction is essentially the same as the couch, the back, C, being placed instead of a head-board, and the cushion, E, replacing the mattress. There is one use to which we think these couches and beds are especially adapted, and that is for



the country surgeon or druggist; they take up so little room, and are so easily and quickly fixed, that they are the very thing for accidental sufferers who may chance to be brought in, and require an operation or amputation before they can be removed with safety; but everywhere and anywhere they will be found convenient and comfortable, and, as we before remarked, cheap.

They were patented April 20, 1858, by Z. C. Favor, of Chicago, Ill. Any further information can be obtained from the agent, E. H. Brown, of the same city.

Pickled Beet Root, Spiced Vinegar, &c.

There are several species of beet root, which are used for different purposes. The white Sicilian beet, from yielding most saccharine matter, is, according to Burnett, chiefly cultivated in France for the manufacture of sugar and spirit. Another kind of beet is grown extensively by farmers, called "mangel wurzel," which translated means "famine's root," but which should more properly have a name indicative of plenty; for many of the roots weigh twenty, thirty, and even sixty pounds each. But we have to speak of the red beet, the *beta vulgaris rubra* of the botanists; and the only thing we could desire respecting this plant is, that it might in reality

be what the botanists term it, *vulgaris*, or common, for a more nutritious esculent could scarcely be found when properly cooked, that is, boiled from one and a-half to two and a-half hours, according to its size. To pickle beet roots, boil them till three parts done, then, when cold, peel them and cut them into thin slices; put the cut slices into a jar, and pour on them hot spiced vinegar, sufficient to cover the whole. After they have stood a month ask us to come and take bread and cheese with you; put the pickled beet on the table, and there will then be a supper "fit for a king."

For every pint of spiced vinegar it is intended to make, take one ounce of black pep-

per, half an ounce of salt, half an ounce of ginger, a quarter of an ounce of allspice, and if desired to be hot, add also a quarter of a drachm of Cayenne, or a few capsicums. Bruise the whole of these materials in a mortar, and put them into a jar, or wide-mouthed green glass bottle, tied over with a bladder. Place this in a saucepan of water, and keep it hot for three or four days, shaking it now and then. If the maker has an enamel saucepan, this operation can be facilitated by simmering the ingredients together. Spiced vinegar is used hot for walnuts and cold for cabbage.

SEPTIMUS PIESSE.

TO KEEP THE HANDS WHITE AND SOFT.

—In order to preserve the hands soft and white, they should always be washed in warm water, with fine soap, and carefully dried with a moderately coarse towel, being well rubbed every time to ensure a brisk circulation, than which nothing can be more effectual in promoting a transparent and soft surface. If engaged in any accidental pursuit which may hurt the color of the hands, or if they have been exposed to the sun, a little lemon juice will restore their whiteness for the time. Almond paste is of essential service in preserving the delicacy of the hands. It is made thus:—Beat up four ounces of bitter almonds, add to them three ounces of lemon juice, three ounces of almond oil, and a little weak spirit of wine and ether. The following is a serviceable pomade for rubbing the hands on retiring to rest:—Take two ounces of sweet almonds; beat with three drachms of white wax, and three drachms of spermaceti, put up carefully in rose water. Gloves should be always worn by ladies on exposure to the atmosphere.

INVENTORS, MILLWRIGHTS, FARMERS,
AND MANUFACTURERS.

FOURTEENTH YEAR!

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