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down the inclined bar, z', until when the head block has traveled the given distance (three feet), the index, x', is vertical, therefore all the workman has to do, is to keep turning the screw, x. by the hand wheel, A, and gearing, which rolls the log and carries the index board across the head block, consequently, by keeping the point marked opposite the end of the index, x', the cut will be gradually brought to the required angle when it arrives at the given point; thus a continued variation in the curve or twist of the cut can be made from this point by proceeding as before, and the curved or twisting cut be made in either direction, according to which of the levers, x'', are connected to the index, x', the beveling bar, z' being on the proper side of the head block.

We regard this as a very important invention. We have seen it in operation, and can speak with confidence of its maerits. It is without doubt capable of making an important revolution in the process of ship building. It is certain that by this arrangement of machinery a timber can be sawed to any desired shape, and this with rapidity and precision, and we are confident that shipbuilders will consult their own interests by introducing it into their yards. A machine is on exhibition at Tupper's Foundry, Avenue C, near 11th street.

For further particulars, address the U.S. Patent Ship Building Company, No. 30 Merchants Exchange, New York.

Varnish for Patent Leather. The process followed in France for glazing leather is to work into the skin, with appropriate tools, three or four successive coatings of drying varnish made by boiling linseed oil with white lead and litharge, in the proportion of one pound of each of the latter to one gallon of the former, and adding a portion of chalk or ochre. Each coating must be thoroughly dried before the application of the next. Ivoryblack is then substituted for the chalk or ochre. the varnish slightly thinned with spirits of turpentine, and five additional applications made in the same manner as before, except that it is put on thin and without being worked in. The leather is rubbed down with pummice-stone powder and then varnished and placed in a room at 90°, out of the way of dust.

The last varnish is prepared by boiling $\frac{1}{2}$ lb of asphalt with 10 lb. of the drying oil used in the first step of the process, and then stirring in 51b. copal varnish and 10 lb. turpentine. It must have a month's age before it is fit for use.

Telescope for Amherst College.

The Hampshire "Gazette" says that Alvan Clark of Cambridgeport, has received an order from Amherst College, for a telescope, the expense of which, cannot be less than \$1,800.-It is to be the gift of Hon. Rufus Bullock, of Rovalston, Mass., a man who is the architect of his own fortunes and is fruitful in good works. Mr. Clark, who makes the telescope, is a wonderful man. Aside from the fact of his being one of the best portrait painters in Boston, he is an indefatigable and successful astronomer-He has discovered several new stars, and made out several double stars, which are not put down in any of the catalogues.

Blowing up the Ice.

Several experiments have recently been made at St. Louis, to see whether it were practicable to open a channel across the river, for the ferry boats, by blowing up the ice with powder. A two gallon keg, filled with powder, was sunk to the depth of twelve or fourteen feet, near the Illinois shore, and it was fired by

Scientific American.

Imponderable Agents .--- No.10. [Second Series.]

HEAT, LIGHT, AND ELECTRICITY .- The theobe divided into three heads: 1st. That Light, Heat, and Electricity are but different qualities or actions of all matter, developed under different conditions. 2nd. That they are different qualities or actions of one subtle fluid, developed under different conditions. 3rd. That they are phenomena of three different subtle fluids.

None of these theories are new. Light, as we a subtle fluid, by Descartes; electricity has always been considered a fluid, and by Du Fay, as two fluids. Heat has also been held to be a fluid of inappreciable tenuity, with particles endowed with indefinite idio-repulsive powers, as described by Dr. Ure and other scientific writers.

There is so much of which we are ignorant connected with the phenomena of these three powers, that we dare not advance any dogmatic opinions, in favor of any one of the theories. The term "imponderables," applied to these powers, is not a correct one, for it means something destitute of weight, therefore not subject to the law of gravity, and until we find some material substance, possessing this quality, it is just as applicable to an action or a motion, as to light or heat. There may, indeed be a subtle elastic fluid throughout space, which has not been detected by our yet imperfect instruments. A substance bearing the same relation to hydrogen (in weight) that it bears to platinum could not be weighed by any instrument in our possession.

HEAT.-The only apparently good argument in favor of heat being a substance-an elastic fluid—is, that it expands bodies, to this we may add another, viz., generating heat by friction. Neither of these positions, however, are strong. Cold expands bodies, as well as heat. Water expands by the addition of 180° from 1000 parts by measure to 1045-1 in 22. Water contracts in bulk by lowering its temperature until it reaches 40° but below this temperature it expands. If heat is a fluid, it should expand ice or water at the freezing point, but when heat is applied to water at 32°, instead of expanding, it contracts in bulk, until it arrives at 40°, when it expands with every increment of heat. Some may suppose that ice contains air and is indebted to it for its greater bulk than water; but this is not so. There is more air in water than in the ice of our large lakes. The water in freezing gives out its air, and in all our rivers and lakes, there are huge air crevices and rents, to allow the air to escape, as the water freezes below. By experiments with pure Norway ice, Prof. Donnet, proved that it could be heated up to 300° under oil at which point it exploded like water at the same temperature deprived of all its air. If a strip of gutta percha be plunged into boiling water, it contracts both in length and breadth. Dr. Ure calls this "a remarkable phenomenon apparently opposed to all the laws of heat."

It would also appear from Count Rumford's experiments, that by a moderate degree of friction, the same piece of metal may be kept hot for any length of time; so that if heat were a fluid contained in the pores of metal, the heat pressed out by friction must be inexhaustible. which is simply an absurdity. Sir Humphrey Davy believed that the phenomena of heat might be referred, as he says "to a vibratory motion of the particles of common matter, or

the ends of the wires of a battery from which | leave one-third of the difference on front of the electricity proceeds; the zinc being the each spindle point, and two thirds on the back. positive one. This term is given to the ends of ries of these three great powers of Nature may the wires, from a belief that they are possessed of attractive or repulsive forces. Prof. Faraday denies the existence of such forces, and asserts that the poles are only doors or pathways for the current. He has therefore substituted the term *electrodes* for the positive and negative poles of a battery. The pole where the current enters the decomposing substance, he names anode, from the Greek word signifying upwards, or the way in which the sun rises. have stated, was believed to be the motion of The point where the current issues from the decomposing substance, he calls the cathode, or downward, following the course of the sun. Decomposition he terms electrolyzation. Although electricity is generally believed to be a fluid; it has never been discovered to possess gravity, or to have increased the bulk of bodies that have been charged with it.

> LIGHT .- Having said so much on this interesting branch of what is termed the imponderables, we will add but a few remarks now, and that for the simple purpose of saying that T. Bassnett, in a work recently published by D. Appleton & Co., of this city, has founded his "Mechanical Theory of Storms," on the supposition that all space is filled with a subtle imponderable elastic fluid, like that described by Euler, the motions of which produce light.

The identity of the three imponderables, is no new idea. Sir Isaac Newton put forth the query whether light and common matter were not convertible into one another, and he also adopted the idea that the phenomena of wheel. The point of the spindle should stand sensible heat depended upon the vibrations of slightly forward, to obviate the difference, (calthe particles of bodies. Euler seemed to entertain the idea that electricity was also derived from the same fluid as light. "Every new discovery," says R. Smith, a somewhat distinguished writer on Electrical Science, "appears to encourage the opinion of the identity of electricity, magnetism, light and heat." Light, heat, and electricity can be obtained from a so lar ray, and from the galvanic current.

We have thus presented many different opinions on the imponderables, that is, respecting a pitman should be hung at right angles with their self, and combined identity. These different opinions do not affect our knowledge of the operations of these powers. Thus one philosopher attributes the rosy, golden, blue, and gray colors, displayed in the heavens at the rising and setting of the sun to the polarization of light; another ascribes the Northern Lights to the effects of electricity; both may be right, but if not, it does not affect our knowledge of these phenomena. This field still stands broad and expansive for future scientific investiga tion; at present we must plead to much ignorance; and when it is considered that photography is almost a new science; that it was unknown but a very few years ago, and that the moon is now made to paint herself with a pencil of her own gentle light, and that plates for printing are now executed by the sun, we may well speak modestly of what we do know, but hopefully of what we may yet know. With these remarks we close the series of articles on Heat, Light, and Electricity.

Setting the Journals of Carriages.

Some time since an inquiry was made through our columns respecting a correct rule for setting the spindles of carriages. The following are three letters sent us in answer to that inquiry:___

ECKMANSVILLE, Ohio. The following is the method which I have practiced for a number of years in setting the

When the carriage wheels are made, with the proper dishing, say about three fourths to one inch, this rule will gather the spindle so that the carriage wheels will stand 14 inches closer on the front than on the back. The front wheels will then stand five feet apart on the ground, and five feet 31 inches on the top, the hind ones over five feet on the ground, and five feet four incheson the top.

I have never known a spindle to heat or cut, when set according to this method.

Jos. R. GATES.

The question of setting the spindle of carriages, is one of no small importance, but the first question to be asked, is "why do the spin_ dles of carriages require a peculiar set?" It is perfectly clear, that if the wheels of a carriage were not dished, and if roads were perfectly level, that the spindles of carriages should be of one uniform thickness and set perfectly straight. But as wheels require to be dished in consequence of uneven roads, something is necessary to obviate this difficulty. As the dish of a wheel is the first cause of alteration, the amount of dish must determine the amount of spindle alteration, (more dish is required in burden than light wagons.) The spindles should always be straight underneath to allow the wheels to play easily; the tire of the wheels should always stand on the ground under the center of the spindle, therefore the taper of the spindle must correspond with the dish of the led "the gather") of friction between the large and small end of the journal; the amount of gather is also in proportion to the dish of the wheel. Now I think it is self-evident, that the surface of the ground bearing on one part, and the load on the spindles on the other, and then meeting at right angles, must necessarily cause less friction, than by any other plan. Many mechanics, however, suit their own convenience, leaving science to follow after, if she will. If its crank, so should the ground be at right angles with the carriage spindle, and the place of contact should be "the centre."

Another question once asked in the Scientific American, "why do some wheels rise over an obstacle easier than others?" is much easier answered than the former. Some spindles are much larger than others, and these have an advantage in the incline of the spindle. A waggon built for rough roads, such as "log paths," should have the spindles of its axles made large; they tend to prevent rebounding; for smooth roads, however, large axles, increase the friction. THOMAS MILLS.

CLEARFIELD PA.

In reference to the setting of carriage spindles, there is one point on which-I believe -all carriage makers are agreed, namely, that the spokes underneath the hub should describe a perpendicular or plumb line to the ground; this being the case, I will say nothing about the gather. The first thing to be examined is the size and dish of the wheel. This being found, get the center of the journal on the side against the shoulder and then strike a horizontal line on the axle from the centre, to the distance of half the size of the wheel, here mark a cross, by the square, and then measure up that line, from the horizontal, the distance of the dish of the wheel. From the last, strike a line to the center of the journal before mentioned, and prolong



Scientific American.



[Reported Officially for the Scientific American.] LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING FEBRUARY 7, 1854.

FOR THE WEEF ENDING FEBRUARY 7, 1854. ROTART ENGING.—Ebenczer Barrows of New York City. Patented in England, July 3, 1851: I claim, first, the re-volving steam wheel, having projecting rims, or flances, revolving within the interior of a stationary cylinder, in which, there are two or more fixed abutments or stops, which fit steam tight, so as to close and divide the annu-lar space, between the cylinder and wheel, into two or more steam chambers. The said steam wheel having four or more pistons, whose operation is controlled by a sistationary curved groove or way in each cylinder head, so as to be alternately acted upon by the steam in the cy linder, and drawn within the wheel, so as to possite dear the abutments or stops, substantially, as shown. I claim, leecond, the six way cocks, or steam heads, two steam passage leading to its plug seat, two steam passage leading from its plug seade opposite chambers of the cylinder, two exhaust passages leading from opposite chambers of the cylinder back to the exhaust rrom opposite chambers of the cylinder back to the plug seat, and one leading from the plug seat to the exhaust pipe, their cook plug being provided with suitable open-ings and **passages**, to make communication to or from the steam and exhaust pipes, to either division of the cylinder, or to close both, as explained. I claim, fourth, the mode of uniting the face and side packing pieces of the pistons and abutments, so as to make them steam tight, at their corners by dovetailing them, as shown.

Them, as snown. I further claim, making the steam cylinder within, and a part of the piston wheel the stationary rim form-ing the outer side of said cylinder, so that three sides of said cylinder shall revolve with the pistons, as set forth.

[See engraving of this invention, on page 25, vol. 8, Scientific American. A curious history could be written of this case had we time to enter into it-the application was pending before the office nearly four years, and a vast quantity of stationary, has been consumed. and a great deal of argument employed in getting it through. There is no doubt of the genuine validity of the patent, as every objection raised by the office has been successfully and pointedly met. Almost any other man except Mr. Barrows would have been disheartened long ago, in view of the repeated defeats, which he has me with, and we hopehe will now realize something handsome as a reward for his preserving energy. Patents have also been secured for this engine, in Great Britain, France, and Belgium, through the Scientific American Patent Agency,

DENTAL CHAIRS. - A. Merritt Asay of Philadelphia, Pa. : I claim moving the chair seat vertically by means of the screw wheels, shafts, rack, and arms, as set forth.

screw wheels, shafts, rack, and arms, as set forth. TURNING LATHES.—Edward Bancroft, & Williams Sel-lers, of Philadelphia, Pa.: we claim the method of vary-ing the motions of the mandril and screw or leader, by means of the two series of wheels, each series consisting of wheels of different diameters, and all the wheels of one series, being connected and turning together, and imparting motion to all the wheels of the second series, with different degrees of velocity, substantially as de-scribed, when this is combined with the method of lock-ing, any one of the wheels of the second series with the shaft of the screw or leader, by having the wheels on sep-rate sleeve arbors fitted to turn on each other, and adpated to receive a locking pin or bolt fitted to holes in a plate attached to the shaft of the screw, as specified, or any arrangement effecting the same end by means substantially the same. We also claim the manner of supporting and sustain-ing the screw (r leader by combining therewith a trough, as specified, having the outer end of the said screw or leader without a journal, as set forth. MaCHINES FOR KLING PAPER.—John & William McAd-

MACHINES FOR RULING PAPER.—John & William McAd-ams, of Boston, Mass.: we claim first, a machine for rul-ing paper, in which, both the horizontal and vertical lines of the sheet are ruled in passing once through the machine, by any arrangement of devices which carries the sheet, after one set of lines is ruled, in a direction at right angles to its first course to another set of pens which rule the sheet across the lines first made. Second, we claim changing the direction of the move-ment of the sheet, after passing from the first set of pens, by means of the travelling band, and revolving drums, as described. MACHINES FOR RULING PAPER .- John & William McAd-

as described. Third, we claimlifting the pens so as toleave a head-ing to the sheet, by means of the roller, with its movea-ble tongue and cam projection acted upon by the edge of the paper and the motion of the feed roll, so as to lift an adjustable arm connected to the pen holder, as descri-bed

addistable in tooline to the perinduct, as descripted. Fourth, we claim forming grooves in the feed rolls, so that the pens may rest over these grooves, and not upon the rolls between the passage of the different sheets, as above set forth. Fifth, we claim guiding the sheet straight to the sec-ond set of pens, after the direction of its movement changed by means of the converging bands which carry the edge of the sheet against a proper guide or axainst the side frame work of the machine, as specified. Sixth, we claim forming the last roll which carries the sheet after it is ruled to the receiver, of a polygonal or angular shape, so that its revolution may give a vibra-tory motion to the sheet for the purpose specified.

tory motion to the sheet for the purpose specified. MACHINES FOR MAKING NUTS.-Jacob Reese, of Sharon, Pa.: I claim, first, the use of the trough of coid water in combination with the rotating die box. for the pur-pose of cooling each die or mouid after it has dischar-ged its nut, and preventing the water from coming in contact with other parts of the machine, or with the nuts which are made in it. Second, I do not claim the rotating of the mould box, but I do claim the use of the guide head, constructed as herein before described in combination with the lever, and guide for the purpose of communicating to the ro-tating mould box the peculiar motion required, consist-ing of a succession of sudden yetsteady quarter revolu-tions, each followed by a pause or rest, during which themould box is held firmly in its place in the manner described.

and M. G. Farmer, of Salem, Mass.: we claim the combi-nation of the system of progressive levers with the bat-tery wires the base board and marble platform, so as to operate as specified.

operate as specined. PoLISHING PLOUGH HANDLES AND OTHER ARTICLES— Thomas Blanchard, of Boston. Mass.: I do not claim the invention of an endless polishing or smoothing belt, but what I do claim as new and of my invention, is the above described mode of applying and operating said belt with respect to the article to be smoothed er polish-ed, the same consisting in not only making the said belt to traverse or run on sustaining pulleys or their equiva-lents, but at the same time to rotate such belt and sus-taining contrivances in such manners around the artic-le to be smoothed or polished as to cause the belt while in motion on its rollers to run in contact with and around the surface or article to be reduced, smoothed or polish-ed.

ed. I also claim, the combination of the feeding carriage, its guides, and the guide reliers or the mechanical equivalents therefor, with the endless polishing belt provided with machinery for imparting to it, its com-pound motion or movement in two directions, as speci-fied.

MACHINESFOR CLEANING AND ASSORTING BRISTLES. machiness on ULEANING AND ASSORTING BRISTLES.-George Edward Burt, & David C. Butterfield, both of Westford aforesaidf I claim the combination of ma-chinery for combining or straightening the bristles, and machinery for separating and assorting them as speci-fied.

I claim the combination of the two moveable combs of

fied. I claim the combination of the two moveable combs or rakes, and the two lifter wheels, and their carrying end-less belts, so arranged as described, the whole being for the purpose of first holding the mass of the bristles by one part or portion of it, and lifting and combing the remainder of it, and subsequently seizing 'and lifting it by such combed part or portion, and combing the part previously seized all as specified. And in combination with the machinery for combing or straightening the bristles, and machinery for assort-ing or suparating them, I claim the endless guide belt, the spring band and rapping apparatus or hammer, as applied and made to operate, as specified. I do not claim the combination of an endless platform, a roller, and a series of pressure rollers as employed in the hereinbefore mentioned machine of the said Loren-zo D. Grosvenor, but what I do claim, as of my inven-tion is the combination and arrangement of the two endless brush belts and two series of draft rollers, and their two sets of endless bands, as made to operate to gether and assort the bristles, as specified. I claim the combination of the combs and their grooves, with the delivering rollers, so as to operate as specified. Bro on Duru Spectre – Denter H Chemberlein, of Bee

Brt or DRILLSTOCKS.—Dexter H. Chamberlain, of Bos-ton, Mass: I am aware that a hand drill has been con-structed so as to have its drill shaft supported in a stock and rotate, by means of two beveled gears, one of them being fastened on top of the drill while the other was affixed on a separate shaft disposed at right angles with the drill shaft, and having the crank applied, so as to enable a person torotate it and thereby put the drill shaft in rotation, therefore, lay no claim to such a de-vice, in the said drill stock as exhibited, the crank of it ismade to rotate in a plane parallel to the axis of the drill shaft.

ismade to rotate in a plane parallel to the axis of the drill shaft. The consequence is, that during a rotation of the rank, there is an uneven pressure exerted on the drill, the said pressure being increased at one moment and diminished at another, and in the direction of the axis of the drill. A steady pressure on the drill longitudin-ally as well as laterally is very desirable particularly when a small drill is used, as without it the drill is not only liable to be broken or injured, but to be made to de-viate from its desired course in passing through any-thing. The complication of the construction of the bev-eled gear bit stock, and the disadvantages incident to it while in use render it an instrument of little value and utility. Meither do I claim making a tool stock and the bell crank in one plece of metal, so that their rotations may be equal and simultaneous, but what I do claim is the arrangment of the bell crank separate from, and so as to play or rotate within the tool shaft stock, as specified, the said bell crank having a spur gear to work into a pinion fixed into the end of the tool shaft, and to impart to said tool shaft an accelerated motion essentially as

to said tool shaft an accelerated motion essentially

TOOL HOLDERS — Dexter [H. Chamberlain of Boston, Mass.: I do not claim a split or jaw socket, having a screw and screw nut applied to it for the closing of its jaw upon the shank of an awlor tool inserted between them, but what I do claim as my invention, is my im-proved method of arranging, constructing, and apply-ing together the jaws and confining screws, the same consisting in making the jaws separate from the screw shank, (on which thescrew is cut) and in other respects substantially as described, and not only provi-ding thescrew nut with a closing concavity or socket, to serve whole being so that when the screw nut is servewedown upon the jaws, the combined action of the jaws and the screw nut shall operate to simultane-ously close the jaws at their upper and lower ends as specified. specified.

MANUFACTURE OF TIN FOIL OR SHEETS.—John J. Crook, of New York, N. Y. I claim the New article of manufac-ture herein described that is to say sheets or foils com-posed of tin, and lead formed in separate strata, but so that the exposed or external surface shall be pure tin only for the purpose, set forth.

BLOCKS FOR HORSE COLLARS.-Louis S. Davis, of New Paris, Uhio: 1 do not claim as novel, the construction of a horse collar block in expanding sections.

a horse collar block in expanding sections. I claim the four parted collar block of which the front pair of sections are hinged together at the gullet, and the back pair at the neck of the block, as described, the same being combined with a stationary bolt placed at the intersection of the partings, the said bolt serving to unite the base and cap, and also forming a fixed bear-ing for the right and left hand serew, which in conjunc-tion with the pins on the block and the diverging grooves in the base and cap, effect prolongation and proportional lateral expansion of the block, or device equivalent.

equivalent. **OMNIBUS REGISTER.**—F. **O.** Deschamps of Philadelphia, Pa: I claim attaching the secret slide to the bolt of a lock, as described, so that it can only be moved to expose or conceal the numerals on the diais by a key which properly fits the lock. I also claim, combining the secret slide with a stop bar, as described, so that both move together in such a manner that when the aparatus is left free to work, by the stop, the numerals on the concealed dials are not exposed and when the numerals are exposed to view the apparatus is made inoperative by the stop.

This ingenious inventioniis noticed at length on page

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METALLIC HUBS-J.B. Hayden, of Easton, N. Y.: Ido not claim the flanges either with or without radial slots or recesses for the purpose of admitting the spokes. I claim the disc, in combination with the recesses or saw cuts formed in the end of the spoke, into which the disc is fitted, and acts to secures aid spokes in a perma-nent position, and effectually prevent them working in

LIME KILNS-C. D. Page, of Rochester, N. Y.: I claim the form, as described, of the stock or cupola, in combi-nation with the arrangement of flues from the firecham-bers for the introduction of the products of combustion at the lower end, as specified, to insure the burning of the central part of the charge, as specified. I also claim cooling the calcined lime preparatory to drawing it out and exposing it to the atmosphere by causing a current of cold air to pass through the saddle or its equivalent, placed at the bottom of the stack, and on to which the calcined lime descends, as described.

PLOWS.-John S. Hall, of Manchester, Pa.: I claim the hinges constructed in such as way that the edge of the front part of the mould board may lap over the edge of the back partor wing of the mould board ito prevent clogging.

PORTABLE DOOR LOCKS-J. W. Webb, of Washington D. C. : I claim the claws, in combination with the bar and thumb-piece, constructed as described.

PLANNS MACHINS-J. A. Woodbury, of Winchester. Mass : I claim, first, the combination of the rotary cut-ter, with the presses and bed. Second, I claim the combination of the Bramah wheel, so called, with the rotating disc cutter and its accesso-ries, for the purpose of planing, as set forth.

Eating and Drinking.

I believe that unwarranted and monstrous er rors are propagated, by different writers, on the subject of food and drink. Each man has a whim or hobby, so that it has at length come to the point that if a man will live healthfully to a great age, say a hundred years, he must eat nothing but grapes and drink nothing but rainwater. The gentleman who advocates the grape diet contends that wheat bread ought not to be eaten, that it has too much earth in it. and tends to stiffen a man's joints and muscles half a century sooner than if he subsisted on grapes.

There are certain districts in the United States where new notions of every description flourish with amazing vigor, as far as the number of converts are concerned; among these mere notions are the injurous effects of tea and coffee as adaily drink.

I think that it is demonstrable that a single cup of weak tea or coffee at a meal, especially in cold weather, and most especially in persons of a weakly habit or constitution, is far more healthful than a glass of cold water.

Tea and coffee doubtless do injure some people-that is, some persons may not be able to drink them without its being followed by some discomfort; so will even water, if used too freely; and I think it will be found that, in nearly every such case of uncomfortableness after a cup of tea or coffee, this condition of things has been brought about by the too free use of these articles, or that the tone of the stomach has been impaired by improper eating.-[Hall's Journal of health."

Ammonia in Distilled Waters.

Boussingault refers to the necessity of de termining the quantities of ammonia contained in well-water, river-water, &c. Since the time (1802) when De Saussure ascertained the first traces of ammonia in the air, since Brandes (1825) discovered it in rain-water, and especially since the time when Liebig distinctly proved this occurrence of ammonia, no complete investigations into the quantity of ammonia contained in natural waters has yet been made.

Boussingault has now begun to determine the ammonia in such waters by means of a distillatory apparatus. He regards it as certain that a water charged with a small quantity of ammonia will have given off the whole of this with the watery vapor when two-fifths of the water have distilled over.

We may, consequently, by submitting large quantities of water, as 10 litres or more, to a preliminary distillation, obtain a concentrated fluid. so as to treat this in the still set apart for the determination of the ammonia. Where the water is not too poor in ammonia, it may be placed in the apparatus itself.

The author then instituted experiments to test his method, and from these it appeared that distilled water to which a known quantity of ammonia had been added furnished more ammonia than had been mixed with it; so that apparently all distilled water contains ammonia.

some who have not the least necessity for their use; this may account for an apparent increase of weak eves.

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Manufacture of Steel.

The conversion of cast-iron into steel is desirable, if it can be effected rapidly and economically; for articles might be cast directly from a blast-furnace or a cupola, and then steeled to a greater or less depth, without altering their form, inasmuch as only a small quantity of carbon, a small percentage of the weight, is required to be removed. For a large number of purposes, this steeling need not proceed to a great depth, especially where toughness of body is not a requisite.

Attempts have been recently made to effect this decarbonization of cast-iron by burning off a part of the carbon in cast-iron, since it is known that the intermediate qualities of steel between bar and cast-iron are due to its intermediate state of carbonization. Riepe's process (Lond. Journ. Oct. 1850) is a modification of the process for decarbonizing cast-iron in a puddling-furnace by regulating the heat in the finishingprocess, and adding iron towards the latter part of the process. He also proposes imbeding cast-iron in clay and keeping it at the welding heat of steel, to effect the same purpose; and still further, the oxydation of castings by atmospheric air. The process of making malleable castings is also based on the same general principle. Such process, as far as we know, can only produce inferior qualities of steel, although they may possibly produce a material having exactly the due quantity of carbon; for as the metal is subjected to a comparatively small amount of working, a considerable proportion of the impurities, silicium, phosphorus, metals, &c. will remain in the mass and deteriorate the quality of the metal. The superior quality of steel is mainly due to a more or less perfect removal of injurious constituents, while, at the same time, much iron is oxydized and removed. By any of the processes yet known, it is impossible to avoid labor and loss of iron in making steel, and these seem to be in direct proportion to the quality of steel to be made. Late examinations by Miller of castings rendered malleable by cementation, seemed to prove that not only carbon, but even silicium had been extracted. Thisstartling assertion needs further investigation; for, should it be confirmed, the present modes of making bar-iron and steel may eventually give place to, or be modified by, processes of cementation.

It would be an important addition to the metallurgy of iron, if we possessed a rapid, economical, and efficient method of partially converting wrought-iron into steel; for iron may be more conveniently forged than cast into many forms, and, if then steeled externally, or at certain required points, they would possess a core of tough metal with an exterior capable of being hardened. Hence, patents have issued and processes been proposed to effect this object; but we may conclude that the experiments have not been successful, since they have not come into general use. Charcoal, mixed with a little borax, salammoniac and saltpeter, has been proposed (Lond. Journ. xxxvi. 26) as a material to imbed articles forged of iron. As prussiate of potash has a marked effect in converting iron into steel, a bed of charcoalimbued with a solution of the prussiate might answer the desired end. The greatest difficuly lies in limiting the depth of the transformation into steel, since the depth seems to depend on the length of cementation, so that large and small pieces cannot be cemented at the same time in

described. WINNOWERS.—Michael Shimer of Union Township, Pa. I do not claim the adjustable side alone but I claim the moveable side in combination with the inclined screen, said combination subserving three purposes, for pre-venting the grain from passing over the edge of the screen until I thas been properly presented to the blast or draft. for partially cutting off the draft, as the state of the grain may require. for expanding the draft of the blast in such a manner that the pure grain will not be carried over, into the horizontal part of the trunk. Second, I claim the square rubber in combination with the circular flanch formed on its lower extremity as described for the purpose of mashing or grinding all impurities, softer than the wheat, and also for prevent-ing the grain from passing out of the bottom of the hop-per before it has been thoroughly pulverized, as descri-bed

per bed

WINNOWERS.-Josiah Turner, & W. C. Steroc of Suna-pee. N. H: we do not claim the toothed cylinder or threader with its corresponding foothed concave, nor do we claim either of the devices described separately. We claim the combination of an oscillating cradle of slanting slat or blind work, as within settorth with the two blowers and the the fender, as set forth.

MAKING BATTERY CONNECTION WITH AN ELECTRO MAG-NETIC COLL ON THE TRAVELLING CARRIAGE OF A TELEGRAPH-IC REGISTER.-John M. Batchelder, of Cambridge Mass.

the hub, as described.

The hub, as described. DRESSING SPOKES-By Ansel Merrell, of New Bedford, Pa. (assign or to Ansel Merrell & J. M. Irvine, of Sharon, Pa.): I claim the combination of the cam lever, having a screw thread thereen, with the adjustable dogs and supportsset forth, whereby the rough slick or block may be held firmly at any required angle to the carriage and at a variable distance below the knives, in order that it may dress spokes of variable taper and of different length and thicknesses.

DAGUEREOTTRE PLATE HOLDER-Reuben Knecht, of Easton, Pa.: I claim the application of the eccentric wheel to the projection of the arms, which is effected by turning the swivei, which is firmly attached to the wheel aforesaid, and the application of the oblong aperture to the projection of either arm, according as one or the oth-er of the armsrequire a further projection, for the pur-pose described. er of the arms i posedescribed,

SEWING BIRDS-J. E. Merriman, of Meriden, Conn.: I Claim employing, in connection with a sewing bird, a spring tape measure arranged in a case placed directly under the belly of the bird; the said case being so situ-ated that it may have, if desired, a handsome pin or needle cushion placed on its top; this arrangementren-dering the sewing bird capable of measuring as well as holding the cloth while the sewing or measuring opera-

Weak Eyes.

A number of our cotemporaries, have been lamenting over "the vast number of people who now wear spectacles," and assert that our grandfathers and grandmothers maintained their arranging upon runners a tool similar in its convision strong and clear for a greater number of years than we, "their weak-eyed descendants." This we think is a mistake. It strikes us that be set to rake the ground, gathering up the the present is just as clear and strong sighted manure, or tilted so as to release its load. It as the past generation. Spectacles are cheap. is intended when used in yards to be drawn by er than they were twenty-five years ago, and a horse. The inventor has applied for a pagold ones are very fashionable at present with tent.

the same bed .--- [Transactions of the Smithsonian Institute, Profs. Booth & Morfitt.

Manure Gatherer.

A. R. Hurst, of Harrisburgh, Pa., has invented an implement for gathering the manure of barnyards and sheds in heaps for greater convenience of loading upon carts. This is done by struction to an ordinary manure fork, yet larger and stronger, in such a manner that it can