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### Agricultural Science—Sandy Soils.

At a meeting of the Farmer's Club held at the American Institute, on the 2d inst., an able essay on soils was presented by Professor S. W. Johnson, of Yale College, New Haven, Conn. The following are some of the views contained in it:—

"The labors of chemists to discover positively all the causes of the fertility of soils have not yet met with conclusive success. The mechanical structure of soil is of primary importance. Naked rock grows lichen—the same rock crushed into coarse grains, grows a much higher order of vegetable—pulverized fine, the cereals grow in it. Geology, chemistry, botany, physiology, meteorology, mechanics, hydrodynamics, heat, light and electricity, are all intimately combined in the grand process of vegetation. There are sandy soils in our Eastern States, which, without manure, yield meagre crops of rye and buckwheat; but there are sandy soils in Ohio, which, without manure, yield on an average eighty bushels of Indian corn an acre, and have yielded it for twenty to fifty years in unbroken succession, the ingredients of these soils being, by chemical analysis, the same. At present no difference is known between them, except the coarseness of the particles—the first being coarse, while the Ohio sand is an exceedingly fine powder. The power of soils to attract and imbibe moisture and oxygen was well shown by Schubler, of Hoffman, 40 years ago. Of 13 different soils quartz sand absorbed in thirty days over 1-1000 parts of oxygen and no moisture, while humus absorbed 13 of oxygen and 120 of moisture."

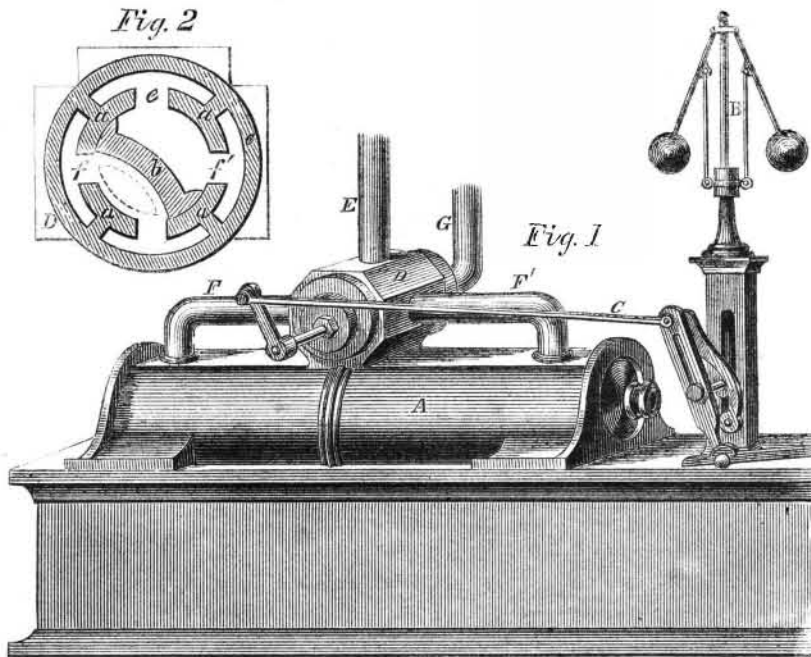
### Patent Law Question.

Messrs. Editors—If A, of New York, buys of an inventor in Boston a patent machine, the use of which is confined, by papers signed by both parties, to A's own business in New York, and A exchanges his old machine with the inventor for a new one, and the inventor sends an order on A to B in New York to take possession of the old machine, which B does, and sells it to C, who knows nothing about how B came by it, can C use the machine in New York, or in any other place he chooses, or can the inventor stop it, or is any one liable for damages? M. B.

[The inventor or patentee has the sole right of "making, using, and selling;"; therefore C has no right to use the machine which he purchased from B, without the consent of the patentee. Ignorance in the case of purchase is not a valid excuse for the infringement of a patent right.—Eds.]

THE lightest substance at present known is hydrogen, which is sixteen times lighter than air, hence it is used to fill balloons.

## COMBINATION STEAM VALVE.



Could the shade of immortal Watt once more revisit the earth, it would feel a sense of satisfaction when contemplating the varied and numerous improvements which have been made to the steam engine since his day, and how greatly steam has been economized by mechanical devices during the past half century. It is our pleasant task to chronicle these improvements, which have, to the true thinker, a deeper meaning than money-making; each improver or simplifier of means to an end, being an aid to progress—a help to civilization. Such an improvement is the combination steam valve invented by Robert Stewart, of Elmira, N. Y., and which is fully explained by the accompanying illustrations. It combines in itself a steam valve, a regulating valve, a graduating cut-off, and a stop valve.

Fig. 1 is a perspective view of the invention applied to a steam engine, A being the cylinder, B the governor, that by means of a slotted piece acts upon the link, C, which is also connected with the eccentric and stem of the valve, thus regulating its motion by the governor. D is the valve, G being the induction pipe, E the exhaust, and F F' the pipes admitting steam to their respective ends of the cylinder.

The construction of the internal parts are better seen in the cross section, Fig. 2. A shell, c, has bearings, a, in it, provided with ports, e f f', each of which communicate with their respective pipes, E F F', and the intervals between the bearings and the shell form steam passages. The valve is seen at b; it is placed on a stem, which is connected with C, and the steam finds its way in through an opening in its end, represented by dotted lines. In the position which the valve is placed in, in the section, the steam would be passing to the end, F, of the cylinder, while F' would be exhausting through the exhaust, E. By placing (with a hand lever or similar means) the valve so as to close both ports, f f', it becomes a stop valve, no steam being then able to pass into the cylinder. The friction is very slight, and there is no hindrance to the steam passing directly to the cylinder from the boiler, as in the ordinary steam chest, and on the whole it is an excellent contrivance.

It was patented September 14th, 1858. The inventor will be happy to furnish any further information upon being addressed as above.

### Mulsum-in-Parvo Bath.



The above illustration, which we transfer from the pages of the London *Artizan*, shows a very simple and exceedingly valuable improvement in the construction of the most important of all domestic conveniences and requisites for health-maintaining purposes—the bath. Cleanliness is said to be next in degree to godliness, and anything which renders the attainment of daily ablution more easy, agreeable, and inexpensive, and more consistent with the economy and arrangement of general domestic life amongst the less wealthy and luxurious classes, should be hailed as a great boon to society at large. The chief cause of this much-to-be-deplored state of bodily uncleanness is the almost impossibility of any but a wealthy or well-to-do person being able to afford the first cost of a reclining bath, and also that the very large quantity of water requisite renders it difficult to be readily obtained without help, or some other interfering cause steps in to render it difficult, expensive, troublesome, or impossible. The great disadvantage of the ordinary hip bath is, that it does not permit of the feet being immersed simultaneously with the posterior portion of the body, and the position of the bather is not the most favorable for cleansing the upper parts of the person.

This bath is only about the size of, and in appearance externally very much like, the ordinary hip bath, and being quite portable, may be kept in the bed-room or dressing-room; the small quantity of water which is

necessary for enabling a complete and thorough cleansing of the person to be performed, renders it capable of almost instantaneous use, independently of any assistance from servants. In using the bath, the bather sits upon the seat, with his feet in the lower part, or foot-bath portion, just as if sitting in an arm chair; the splayed sides prevent splashing over. The seat has a movable pool or dish, which is used as a sponging bath, or a bidet, and which, upon being removed, allows of the lower part, or foot-bath portion, being used as a hip bath; thus this bath combines in one and the same apparatus, a sponging bath, a foot bath, a hip bath, and a bidet; and, by the addition of a pump and the usual poles and fittings, it may also be used as a shower bath. Now, a great domestic convenience such as this, commends itself directly to the serious and immediate attention of every one who values health—and there is no better promoter of bodily health than daily ablutionary exercise—and this is, by this new bath, rendered quite practicable for those to whom it was before absolutely impossible.

### Improvement in Steamships.

Although during the past few weeks we have occupied our readers' attention with remarks upon the construction of ships and the preservation of life at sea, and have incidentally made many suggestions upon these important topics, there is still left one idea which has not been touched upon, and which is a very important consideration in case of accident by fire or storm, this is the presence of the machinery. The weight of the engines and boilers of an ocean steamer varies from 300 to 700 tons weight, and it must be recollected that this is dead weight, interfering with the buoyancy of the ship, and becoming a positive incumbrance the moment it is disabled. By the ingenious method of constructing steamships and placing the machinery invented and patented by Messrs. Salomon & Morris, of this city, the moment the captain discovers that the engine and boilers can be of no more service, they can be let fall into the water, thus lightening the ship in case of storm, and saving the cargo, or in case of fire affording a space into which the passengers can go and remain cool and safe from the ravages of the flames. There are other points in the construction of their boat which also deserve to be noticed, namely, the shape of the guards, and the life-preserving tubes which are secured underneath them, and the admirable method in which the hull is trussed, but we will desist, as it is only our intention to call the attention of practical shipbuilders to the invention.

### Tanning Deer Skins.

The method usually practised in preparing deer skins for market is as follows: The skins are placed in a barrel of water with enough ashes to make a weak lye. They remain there until the hair comes off easily with a graining knife, and they are then grained. They are then hung up to dry until hard and flinty, and then they are soaked in rain water with a little soft soap; the water being about blood warm. To dry them wringing is resorted to, and after this process, the wrinkles are pulled out by the hand. They should be next smoked with rotten wood or sawdust, in a long trench for a day or so, the skins being placed loosely in a box or barrel, and again washed in rain water. This process is repeated two or three times and a very well tanned skin is the result.



HAND PRINTING PRESSES—J. N. Phelps, of New York City: I claim, first, The combination and arrangement of the radial pins, T, on the transverse shaft and shoulder cam, S, on the sides of the lever, N, oscillating arms, J, spiral springs, U, for moving the same automatically, and spiral springs, M, for pressing the ink roller in contact with the printing rollers, Q, R, when receiving the ink from the same, and in contact with the face of the type in the form secured to the under part of the platen, G, substantially in the manner and for the purpose described.

LIFTING HANDS.—Joseph B. Sargent, of New Britain, Conn.: I claim, first, that handles that have been made with projections similar to D, for the purpose of striking on the plate, to prevent the handle from being raised above its proper position when in use. I therefore do not claim as my invention the projections, D D, nor their striking on the plate.

HEMP BEAKERS.—William Shelby, of Waverly, Mo.: I do not claim, broadly, the invention of reciprocating beaters or blades for hemp machines. But I claim the arrangement of the beaters or blades, I, J, at varying distances, in combination with the yielding plates, K, as and for the purposes shown and described.

COMBINED BOOK AND SLATE.—Forrest Shepherd, of New Haven, Conn.: I am aware that slates have been used in books, where it was necessary to turn back and forth from one to the other, which in general is attended with more inconvenience than where the two are used separately. I therefore do not claim that arrangement as such as my invention.

CAR SEATS.—John W. Sibbet, of Cincinnati, Ohio: I claim constructing every alternate seat in two distinct parts, and providing the upper detachable portions, A, with guiding hubs, L, at their ends, to which are attached straps or bands, K, for elevating them, horizontal spring bars, N, whose ends enter slots, J, in the guide columns or posts, I, for sustaining them, in conjunction with the straps or bands, K, in their elevated portions, A, and combining with the said upper detachable portions, A, and the permanent seats, A, pieces of canvas or other material, capable of being packed in the boxes, B, of the seats, the whole being constructed, arranged and operated substantially as described.

RAILROAD CHAIRS.—James H. Simmons, of Painted Post, N. Y.: I claim the construction of a chair raised in the center for the ends of the rails to rest on, as shown at c and sloping from each end toward the center of the chair, leaving a space between the rails and the chair over the sloped portion, to accommodate the spring of the rails, together with projections, V V, as described.

PREPARING WOOL AND OTHER FIBERS FOR SPINNING.—Waterman Smith, of Manchester, N. H.: I claim, in the process of drawing wool and other fibrous substances, heating the sliver of wool, or other substance, and keeping it hot while it is being drawn, by passing it over or against, and in contact with, heated surfaces, either moving or stationary, substantially as described, for the purposes set forth.

MACHINE FOR CREAMING AND BLACKING LEATHER FOR HARNESS.—Adolph Stempel, of Quakok, Ill.: I do not claim, broadly, the employment or use of creaming and embossing rollers, in connection with a pressure roller, for ornamenting and creaming leather, for such device has been previously used.

PEDAL ATTACHMENT FOR PIANOS.—William B. Stetson, of Taylor, N. Y.: I claim the construction and arrangement of the pedal chord bars, b b b, connecting suspension rods, c c c c c, and upper bars, f f f, and finger rods, l l l l l, and operated as described in combination with key-board instruments, and whereby the corresponding harmony of any melody or air is produced simultaneously therewith by the performer, through the agency of the feet, substantially as set forth.

SAFETY APPARATUS FOR STEAM BOILERS.—Francis Stebbins, of Hinsdale, N. H.: I am aware that it is not new to so combine a vessel with a boiler and an alarm or signal apparatus, that such vessel, when the water in the boiler may be above its lowest safe water level, shall be kept filled with water by the pressure of the steam, and when such water may fall below such level of safety, such vessel, by the entrance of steam into it, shall be emptied of its water and thereby, by the abstraction of the weight of water from such vessel, the alarm or signal apparatus shall be put in operation, and therefore I do not claim such, although I maintain this principle of operation in carrying out my invention, I effect an important and valuable improvement, as my invention rests on an improved mode or means of carrying out such principle, and consists in an arrangement of pipes with respect to the vessel and boiler, whereby the steam and water passages are entirely separate from one another, so that the water does not hinder or obstruct the passage of the steam from the boiler to the vessel, D, one not having to rush directly by and in contact with the other, while the steam may be flowing into the vessel, D, of the safety apparatus. Furthermore, my arrangement presents other advantages, as by means of it the safety apparatus is entirely out of the boiler, and is not liable to be injuriously affected by the foaming of the water in the boiler.

SPEED INDICATOR AND RECORDER FOR RAILROAD CARS.—J. Dutton Steele and William Lorenzo, of Pottstown, Pa.: We claim the governor shaft and indicator, and the shaft carrying the prepared paper, in combination with the main driver, arranged and operating as described.

HARVESTERS.—Charles T. Stetson, of Amherst, Mass.: I claim combining two double-edged cutting blades with each of the vibrating cutter shanks for the purpose of reducing the number of joints in the cutting apparatus, substantially as set forth.

LOCK.—O. B. Thompson, of Hudson, Ohio: I claim the tumblers, f, and guards, g, constructed and arranged substantially as shown, and placed in such relation with the plate, b, of the bolt tumbler, C, and slides, j, to operate as and for the purpose set forth.

SEEDING MACHINES.—Joseph Walton, of Delavan, Wis.: I do not claim the sowing of grain broadcast by centrifugal force, nor combining a sewing machine and a harrow, nor the use of two or more kinds of grain at one and the same time.

CAR BRAKES.—J. N. Ward, of Brooklyn, N. Y.: I claim the combination of the pulleys and brakes, together with the mode of operating the same, the whole being constructed and arranged as specified, and for the purposes set forth.

SELF-INKING HAND PRESSES.—Daniel Zaern and L. L. Byvan, of Shamokin, Pa.: We claim the combination of the arm or lever, G, with the shaft, H, the crank, I, and the vertical revolving shaft, J, and the connection of shaft, J, with the revolving arm, K, thereby accomplishing a double action, viz, first upon the ink roller, L, second upon the movable bed, E, for reception of card or paper to be stamped or printed. By downward pressure of lever, A, roller, D, moves horizontally over ink sponge, F, in contact with it.

AXLE BOXES.—Henry Howson, (assignor to Isaac P. Wendall and Jacob L. Wendall), of Philadelphia, Pa.: I claim the combination of the box with the bearings, B and B', and retaining keys, C and C', when the interior of the box is arched on the top, when the said arch terminates on each side of the recesses, g, g', formed in the sides of the box, when the keys are adapted to fit into the recesses and against the edges of the bearings, and when the several parts are arranged in respect to each other, substantially in the manner and for the purpose set forth.

WEIGHING CARTS.—James W. Martin (assignor to Lewis Rothermel), of Philadelphia, Pa.: I do not claim the application of a scale beam to a cart, for the purpose specified, for this has been formerly done, and may be seen in the device patented by me, and formerly alluded to.

PADLOCKS.—E. M. Mix and J. E. Mix (assignors to themselves and C. D. Johnson), of Ithaca, N. Y.: We do not claim, separately, the curved tumblers, a, for they or their equivalents have been previously used.

BILLIARD TABLE.—Daniel D. Winant, of New York City, assignor to William R. Winant, of Brooklyn, N. Y.: I claim, first, Constructing the beds of billiard tables of slabs of glass, substantially as and for the purposes specified.

MECHANICAL MOVEMENT.—Joseph H. Davis, of Woburn, Mass.: I claim the arrangement set forth for transmitting power from any prime motor to a propelling gear or wheel, viz, through the intervention of a series of curved or bent and weighted arms, said arms working together and connected to the gears at their ends, substantially in the manner and for the purpose set forth.

RUDDER FOR VESSELS.—Elias Yerkes, Jr. (assignor to himself and George Yerkes), of Philadelphia, Pa.: I do not claim, broadly, making a rudder in two parts, and connecting them so as to act simultaneously, but independently of each other.

MODE OF GENERATING HEAT.—T. R. Hartell (assignee of Wm. Hartell and Jos. Lancaster), of Philadelphia, Pa. Patented Nov. 23, 1852: I claim the adaptation of, or rendering available, tar, as a fuel for the production of the intense and steady heat required for the melting of glass and for other processes and manufactures, by introducing water or the vapor of water into furnace or fire place, in contact, combination with, or in close proximity to the tar, substantially as set forth.

SEWING MACHINES.—I. M. Singer and E. Clark (assignees of John Bacheider), of New York City. Patented May 8, 1849: What is claimed is the combination of mechanism substantially such as is described, so that the cloth or fabric to be sewed being placed upon the machine will be automatically fastened on to the feeding apparatus, carried forward to receive the stitches, and discharged from the feeding apparatus, substantially as described, and so that seams of any desired length may conveniently be sewed.

CORN HARVESTERS.—E. C. Manck and W. T. McGahay, of Conrad's Store, Va. Patented April 22, 1855: We claim, first, The rotary arms, p, in combination with eccentric guides, q, substantially in the manner and for the purpose specified.

METHOD OF ATTACHING LAMPS TO LANTERNS.—John F. Smith, of Philadelphia, Pa. Patented July 6, 1853: I claim the improved arrangement described, the same consisting in the attachment of the spring, D, and clips, E, E, to the lamp case, instead of to the lantern as and for the purpose specified.

DESIGN. STOVES.—E. J. Cridge, of Troy, N. Y.

Monster Steam Hammer. There is at present being constructed in Newcastle-on-Tyne, says the London Times of the 4th ult., by Messrs. Morrison & Co., engineers, of that place, a monster steam hammer, ordered by the Russian government. It is the largest ever constructed on the Tyne, and is of most gigantic proportions. It is constructed on the principle of Messrs. Morrison's patent. The hammer bar and piston are forged in one solid mass. The diameter of the bar is thirteen inches, and that of the piston thirty-one inches, and the total weight of this portion of the hammer exceeds five tons.

It was forged by a two-ton hammer of similar construction. The cylinder stands on two frames of three feet in width, and there is a clear working space of fourteen feet between them. The frames arch overhead, and clasp the cylinder, the whole being securely fitted and bolted together, and forming one solid mass. The total height from the ground to the under side of the frame is nine feet four inches, and the total height of the hammer itself is eighteen feet, the hammer having a clear fall of six feet. The ingress and egress of the steam is regulated by a double balance piston valve, which is worked by hand, by means of a long lever reaching from the valve to a staging, on which the engine-man stands. The number and force of the blows can be regulated, by means of this valve, to be most astonishing nicety, so great being the command which the workmen have over this immense mass, that it can be arrested in a moment, while in the act of falling. One of the great features of this hammer is the entire absence of all complication in its construction, so great, indeed, that it hardly looks complete as it stands, and it seems impossible that one lever could make various changes of movement and varieties of blows, so necessary to forge work, but this is the case. It is very well suited for the rough work it has to undergo, and is peculiarly adapted to be used in countries where—as in Russia—skilled labor is scarce, as it is almost impossible for any portion of it to get out of repair. The breaking of piston rods and cylinders, so common in other hammers, cannot occur here, as the hammer bar or piston rod is of such enormous dimensions, and is forged solid in the piston, the two combined forming

the whole weight of the hammer. This novel machine is just completed, and will, in a few days, be shipped for St. Petersburg.

Domestic Recipes.

ARTIFICIAL FLOWERS.—The beauty of these imitations of the floral world depends upon the taste and skill of the makers. The delicate fingers of woman and her quick powers of imitation, combined with an exquisite taste for the beautiful in nature, enables her to excel in this branch of art, which at present is carried to the highest pitch of perfection in the French capital. Although all the finest qualities of our artificial flowers are imported, still great quantities of them are manufactured in New York City, and they may be imitated by many females as a domestic recreation affording much pleasure. The materials required for them are velvet and fine cambric for the petals, and taffety for the leaves, with thin whalebone or wire for the stems. These are cut into the proper forms and pasted together with a solution of gum-arabic. The colors to produce the shades are put on with a fine hair pencil in the same manner as drawings are colored and shaded. Carmine is employed to produce the red and pink colors; the yellow is a tincture of turmeric; green of distilled verdigris; blue neutralized sulphate of indigo; and purple a tincture of orchil or logwood and the oxyd of tin. Great care is necessary in the employment of these colors.

TO CLEAN GLOVES.—Lay them on a clean board, and first rub the surface gently with a clean sponge and some camphene, or a mixture of camphene and alcohol. Now dip each glove into a cup containing the camphene, lift it out, squeeze it in the hand, and again rub it gently with the sponge, to take out all the wrinkles. After this gather up the cuff in the hand, and blow into it to puff out the fingers, when it may be hung up with a thread to dry. This operation should not be conducted near to a fire, owing to the inflammable nature of the camphene vapor. The receipts given in all the printed books we have consulted for cleaning gloves are barbarous.

MAHOGANY STAIN.—The color of mahogany may be imitated with a strong solution of logwood and fustic put on boiling hot with a brush. The color can be reduced to any depth of shade according to the strength of the liquor employed. After it is quite dry the wood should be varnished and afterwards polished. A varnish made with dragon's blood dissolved in alcohol, and applied in two or three coats will make a very good imitation of mahogany. When dry it should be rubbed down with rottenstone and oil.

ROSEWOOD STAIN.—This is made of a strong solution of logwood and red wood, commonly called hyperic. It is put on the wood when hot with a brush, the dark lines being produced by giving two or three coats, and the light shades one. By washing over the surface of this stain with a weak solution of saleratus, it will receive a bluish tinge and appear of a darker shade. When dry, use any kind of varnish for the production of a polished surface.

YELLOW STAIN.—A decoction of turmeric and a little alum, or the grounds of beer and a little sulphuric acid, makes yellow stain on white wood. Dilute nitric acid brushed over white wood, then exposed to the heat of a stove, also makes a yellow stain; this is the most convenient one for imitating maple.

BROWN GUN BARRELS.—Mix one ounce of nitric acid and four ounces of the sulphate of copper in a pint of water, and apply this to the surface of the barrel, and set it aside to rust for two days. The barrel must now be rubbed with a stiff brush, washed with lime water, dried, and afterwards varnished. It is sometimes necessary to apply two and three coats of the acid solution to obtain a proper coating of oxyd. The lime water neutralizes any free acid that may be left on the iron.