Bog Oak Ornaments.

A gentleman, connected with the manufacture of ornaments from Irish bog oak, gives to *Land and Water* some interesting particulars with regard to the history of that industry. When taken up this bog oak is perfectly black from the action of the peat or bog water. It is very rarely obtained in a sound state, and in most cases the outer portions of the tree or log are rotted, and useless even for fuel. When laid up for use, care must be taken that it is not placed in the open air, lest it may, from the sun's rays, become open and shattered into chips from end to end. To preserve it, it must be put into some cool place, and left to dry gradually, and when properly seasoned it must be cut in lengths of from two to four feet, and these lengths be split again, and the sound parts removed from the unsound.

It takes from four to six years to season some specimens, as in many instances the wood is found at a depth of eight and sometimes ten feet under the surface. When properly seasoned, any portion requiring to be glued becomes hard as stone, and is firmer and less liable to give way than any portion of the manufactured article. The finish is not quite perfect until the article has been for some time in use, and the longer, the finer the article seems to be, no matter whether used as a personal or table ornament. The men employed are all, without exception, self-taught; each one makes his own tools, and will not take any apprentices; and each person has a peculiar taste for a certain class of ornaments, which he follows, and to which he is left to produce the best specimens he can. There are also jewelers who mount and embellish the ornaments with gold and silver, and with rare and most brilliant Irish gems, such as the Kerry Irish diamond, the emerald, the garnet, amethyst, beryl, aquamarine, and Donegal pebble. The Celtic ornaments are generally studded with the above native gems; they are beautiful, and most artistically executed. The designs embrace some thousands, and all of them are both classic and historically illustrative of Irish antiquities. Extensive deposits of bog oak and other buried woods have been discovered in Germany.

Lesseps and the Canal.

M. De Lesseps would have made a good actor if he had not been a successful engineer. He has been making a tour of France, visiting the commercial cities and lecturing on his new scheme of the Panama Canal. He carries with him his little daughter Tototte, and she goes to the public meetings at which her father speaks. When she becomes drowsy, M. De Lesseps points to her and says: "That little girl will fire the first mine when we come to quarry the canal." Then Mlle. Tototte awakes, and the crowd enthusiastically cheers.

SKIMMING MILK BY CENTRIFUGAL ACTION.

One of the results of modern systems of dealing with agricultural produce has been the growth in most civilized countries of large establishments for carrying out dairy operations in a wholesale way, such establishments being really manufactories in which mechanical appliances can be largely and profitably used to assist or replace hand labor. Among the operations to be performed in connection with such dairies, the skimming of milk occupies no unimportant place, yet until comparatively recently no efficient means of accelerating the ordinary mode of separating the milk from the cream had been perfected. As is well known, the mixture of the milk and cream is a purely mechanical one, the lighter fatty particles of the cream being as it were entangled in those of the milk, and separating from the latter by the action of gravity if the mixture is allowed to remain undisturbed for a sufficient length of time.

Experience has shown that the separation of the cream and milk is facilitated by maintaining the latter at a low temperature; but even under the most favorable circumstances the natural separation of the two substances is a slow operation. The shortest time, in fact, in which the separation has ever been thoroughly produced—so long as the ordinary action of gravity is relied upon to effect the operation—is, we believe, about twelve hours, the milk in this case being treated on Mr. Senwartz's plan, and kept at a constant temperature of about 50° Fah by means of ice. According to the mode of procedure usually followed in this country and in Europe, the separation of the milk and cream occupies from 24 to 96 hours, the result being that in some cases the milk will not stand the period of exposure required to effect the thorough separation of the cream.

Under these circumstances, the idea some years ago occurred of intensifying the action of gravity by employing centrifugal force, and thus effecting the separation of the milk and cream more promptly. So far as we are aware, the first suggestion of this kind was made by Professor C. F. Fuchs, of Carlsbad, who, in 1859, proposed to employ centrifugal force to prove the amount of cream in milk, while in 1864 Mr. Brandtl, a brewer of Munich, applied centrifugal force to the skimming of milk on a large scale. The results of his experiments, however, were not published.

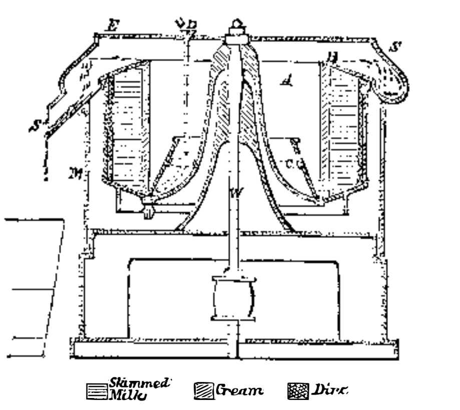

FIG. 2.—CENTRIFUGAL MILK-SKIMMING MACHINE.

Later on, Messrs. Lefeldt and Leutsch, engineers of Scheveningen (Germany), produced a practical machine for skimming milk by centrifugal action. This machine was recently patented in this country through the Scientific American Patent Agency.

Our engravings represent the machine as made by Mr. F. Wannieck, of Brünn, Austria. A is the drum of a centrifugal machine containing the milk to be treated, this drum being provided with a couple of internal paddles which insure the milk being carried round at the same speed as the drum. At the top the drum is partially closed by the cover, B, while within is a conical diaphragm, C, which reaches nearly to the bottom of the drum, as shown. A funnel, D, dips into the drum within the conical diaphragm, this funnel being supported by the cover, E, which does revolve, it being carried by the external casing, M, of the machine.

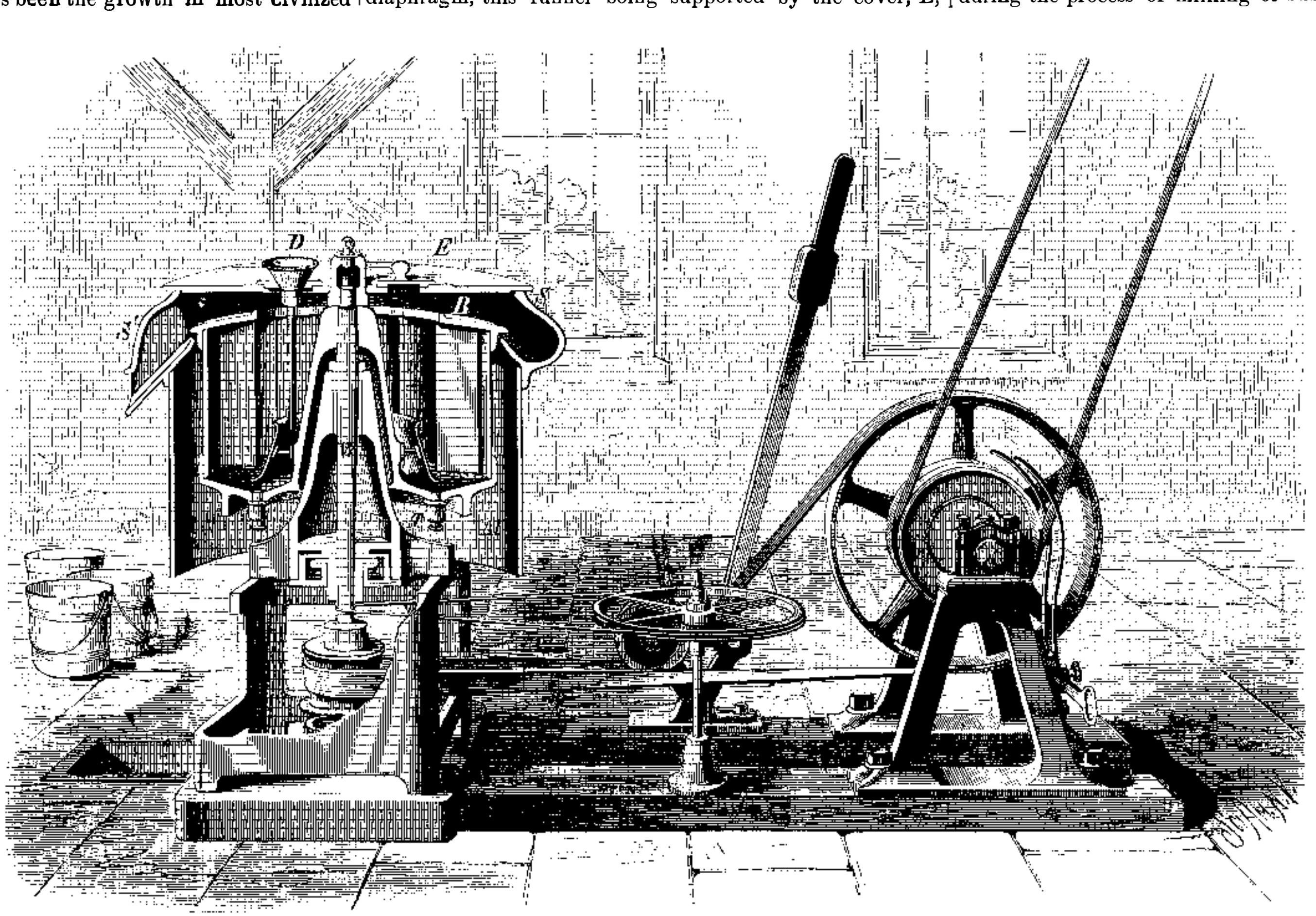

FIG. 1.—LEFELDT AND LEUTSCH'S CENTRIFUGAL MILK-SKIMMING MACHINE.

The vertical shaft of the drum runs in two bearings, as shown by the section, Fig. 2. It will be seen that the external case carries at its top an annular trough, S, this trough being furnished at one side with a discharge spout, S'. The revolving drum is furnished at the bottom with discharge cocks, T'. The mode of driving the drum will be readily understood from the engraving. The base of the machine is connected to a couple of pieces of timber which carry the standards for supporting a short horizontal countershaft provided with fast and loose pulleys, and a larger pulley from which a twisted belt is led off to the pulley on the vertical shaft of the revolving drum. The speed given to the latter is 1,000 revolutions per minute, and the belt driving it passes under a tightening pulley adjusted by the lever shown, this tightening pulley enabling the drum to be started gradually. A light belt on the vertical shaft of the drum gives motion to a revolution counter as shown.

The mode of using the apparatus is as follows: The drum having been charged with milk is set in motion, and as the speed increases the milk rises at the sides of the drum, and eventually assumes the position indicated in Fig. 2. In this position the particles of the milk will evidently, under the influence of the centrifugal force to which they are subjected, have a tendency to arrange themselves in layers in the order of their specific gravity, the heavier particles moving outward, while the light or fatty particles collect on the inner surface of the liquid column. The action of the centrifugal force being much more energetic than the ordinary action of gravity, this separation of the different particles of milk takes place very much more rapidly than when milk is allowed to stand in the usual way, and after the drum has been running at from 800 to 1,000 revolutions per minute for from 25 to 30 minutes, the cream is found to have collected on the inner surface, as indicated in Fig. 2, while all dirt in the milk has been thrown outward against the side of the revolving drum

The next operation is to remove from the revolving drum the cream thus collected. This is effected as follows: It will be noticed that the amount of the charge of milk is such that when it is, by the action of the centrifugal force, thrown into the form of an annular column, the inner circumference of the column is just level with the inner circumference of the partial cover, B, of the drum. To remove the cream some milk—generally skim milk—is poured down the funnel, D, and falling within the conical diaphragm, C, passes under the lower edge of the latter, as indicated in Fig. 2. The milk so introduced passes into the charge without disturbing the layer of cream, and the latter being displaced inward, flows over the inner edge of the annular cover, B, and escapes into the trough, S, from which it is discharged into suitable vessels through the spout, S'. The cream having been thus collected, the machine is stopped, and the skimmed milk run off through the cock, T.

With two machines containing 11 gallons each, 250 gallons of milk can be effectively skimmed in a day of ten hours, while the operation requires no skilled labor and but very ordinary care. Owing to the short time required, also, all chance of the milk turning sour is avoided, and the butter made from the cream is considered of first rate quality. Another advantage of this system, which was not at first counted upon, lies in its thoroughly separating from the milk all dirt which may have become mixed with it either during the process of milking or subsequently. This dirt, which collects as indicated in Fig. 2, smells badly, and an astonishing amount of it is separated by the centrifugal action even from milk which has been carefully filtered through hair cloth, thus showing that the hair cloth filters usually relied upon are far from being thoroughly efficient.

Spontaneous Ignition.

E. Bing, of Riga, Switzerland, has experimented with different materials: wadding, raw flax, hemp, the waste from silk, wool, and cotton spinnings, as well as sponge, and finally wood dust as found in any cabinetmaker's shop. They were saturated with various fluids, namely, oils, fresh and in a gummy state; turpentine, petroleum, various varnishes, etc. All the fibrous materials took fire when saturated with any of these oils or with mixtures of the same. Sponge and wood dust, on the contrary, proved to be entirely harmless.

Combustion ensues, with 17 grains of wadding and 67 grains of a strong oil varnish, in thirty-four minutes; while 200 grains of washed cotton waste, of which a portion was saturated with 750 grains of strong oil varnish, and the remainder wrapped about it, required almost fourteen hours. These materials were placed in a well sheltered spot, and subjected to a heat of from 40° to 65° Fah. Silk did not flame up, but slowly charred.

Disinfectants and How to Use Them.

The National Board of Health, consisting of a number of our leading physicians and chemical experts, of which Prof. C. F. Chandler is chairman, have issued the following instructions for disinfection, intended especially for the guidance of physicians and nurses in the yellow fever districts, but which are equally applicable in other classes of contagious diseases. In submitting this report the chairman says:

It has been the aim of the committee to prepare concise directions for disinfection, so simple and clear that they may be easily followed by any person of intelligence.

In the selection of disinfecting agents the aim has been: 1st, to secure agents which can be relied upon to accomplish the work; 2d, which can be procured in a state of comparative purity in every village in the United States; 3d, so cheap that they can be used in adequate quantities.

It is extremely important that the people should be instructed with regard to disinfection. They must be taught that no reliance can be placed on disinfectants simply because they smell of chlorine or carbolic acid, or possess the color of permanganate, and that, in general, proprietary disinfectants with high-sounding names are practically worthless, as they either have no value whatever, or, if of value, cost many times as much as they are worth, and cannot be used in sufficient quantity.

EXPLANATIONS.

Disinfection is the destruction of the poisons of infectious and contagious diseases.

Deodorizers, or substances which destroy smells, are not necessarily disinfectants, and disinfectants do not necessarily have an odor.

Disinfection cannot compensate for want of cleanliness or of ventilation.

I.—DISINFECTANTS TO BE EMPLOYED.

1. Roll sulphur (brimstone) for fumigation.
2. Sulphate of iron (copperas) dissolved in water in the proportion of one and a half pounds to the gallon; for soil, sewers, etc.
3. Sulphate of zinc and common salt, dissolved together in water in the proportions of four ounces sulphate and two ounces salt to the gallon; for clothing, bed linen, etc.

NOTE.—Carbolic acid is not included in the above list for the following reasons: It is very difficult to determine the quality of the commercial article, and the purchaser can never be certain of securing it of proper strength; it is expensive, when of good quality, and experience has shown that it must be employed in comparatively large quantities to be of any use; it is liable by its strong odor to give a false sense of security.

II.—HOW TO USE DISINFECTANTS.

1. *In the Sick-Room.*—The most available agents are fresh air and cleanliness. The clothing, towels, bed linen, etc., should at once, on removal from the patient, be placed in a pail or tub of the zinc solution, boiling hot if possible, before removal from the room.

All discharges should either be received in vessels containing copperas solution, or, when this is impracticable, should be immediately covered with copperas solution. All vessels used about the patient should be cleansed with the same solution.

Unnecessary furniture—especially that which is stuffed—carpets, and hangings, when possible, should be removed from the room at the outset; otherwise, they should remain for subsequent fumigation and treatment.

2. *Fumigation* with sulphur is the only practicable method for disinfecting the house. For this purpose the rooms to be disinfected must be vacated. Heavy clothing, blankets, bedding, and other articles which cannot be treated with zinc solution, should be opened and exposed during fumigation, as directed below. Close the rooms as tightly as possible, place the silver in iron pans supported upon bricks, set it on fire by hot coals or with the aid of a spoonful of alcohol, and allow the room to remain closed for twenty-four hours. For a room about ten feet square, at least two pounds of sulphur should be used; for larger rooms, proportionally increased quantities.

3. *Premises.*—Cellars, yards, stables, gutters, privies, cesspools, water closets, drains, sewers, etc., should be frequently and liberally treated with copperas solution. The copperas solution is easily prepared by hanging a basket containing about sixty pounds of copperas in a barrel of water.

4. *Body and Bed Clothing, etc.*—It is best to burn all articles which have been in contact with persons sick with contagious or infectious diseases. Articles too valuable to be destroyed should be treated as follows:

a. Cotton, linen, flannels, blankets, etc., should be treated with the boiling hot zinc solution, introducing piece by piece, securing thorough wetting, and boiling for at least half an hour.

b. Heavy woolen clothing, silks, furs, stuffed bed covers, beds, and other articles which cannot be treated with the zinc solution, should be hung in the room during fumigation, pockets being turned inside out, and the whole garment thoroughly exposed. Afterward they should be hung in the open air, beaten, and shaken. Pillows, beds, stuffed mattresses, upholstered furniture, etc., should be cut open, the contents spread out and thoroughly fumigated. Carpets are best fumigated on the floor, but should afterward be removed to the open air and thoroughly beaten.

5. *The corpses* should be thoroughly washed with a zinc solution of double strength, then wrapped in a sheet wet with the zinc solution, and buried at once. Metallic, metal-lined, or air-tight coffins should be used when possible, certainly when the body is to be transported for any considerable distance.

A NEW PUNCHING AND SHEARING PRESS.

In our last issue we gave a brief description of a press somewhat larger and heavier than that represented by the accompanying engraving. The working principle is the same in both, the power being obtained by the swing of a weighted pendulum at the back of the machine in combination with a shaft, automatic clutch, and slide.

"PEERLESS" PUNCH AND SHEAR PRESS No. 2.

In this machine the pendulum is kept in motion by foot pressure upon the treadle, and it punches easily a three eighths inch hole in one quarter inch iron, and an inch hole in one eighth inch plate, six inches from the edge. It is designed to do boilermakers' small work, as well as for the use of sheet metal workers, and especially brass manufacturers. The opening in the bed is six and a half by four inches.

The press weighs 380 lb., and, with the exception of the pendulum and treadle, is in all respects similar to power presses used for the same purposes. With it a boy can easily do all the work by foot as rapidly as by power press and without fatigue. The pendulum can be readily removed and a balance wheel attached to the shaft for power when desired.

To test the capacity of one of these small presses, the manufacturers state that they attached a thirty inch balance wheel, with three inch belt, to the shaft, and with a speed of 125 revolutions per minute they could not punch an inch hole in one eighth inch iron; while the pendulum, worked by foot alone, enabled the machine to punch such holes rapidly and continuously.

This press stands about four feet high, occupies comparatively little space, and seems very substantial. The punch may be easily removed, and a shear may be inserted in the slide for shearing light sheet metal.

These presses are protected by several patents, and are made by the Peerless Punch and Shear Company, 52 Dey street, New York city.

NEW FLANGE COUPLING.

The annexed engraving represents an improved flange coupling recently patented by Mr. Charles H. Cushing, of

CUSHING'S FLANGE COUPLING.

Tidioute, Pa. It is designed for connecting sections of pipe at any angle to each other, from a straight line to an angle of 90°.

The invention consists of two circular plates, each flat upon one side, and having on the other a short internally threaded tubular projection inclined at an angle of 45° to the plane of the plates. The plates are slotted to receive the bolts that fasten them together. This coupling serves as an elbow for pipe and for forming in pipes a joint of almost any desired angle.

A FEW WORDS TO YOUNG STEAM FITTERS.

BY A STEAM FITTER.

Feed Pipes.—The feed valve should be a globe or angle valve placed near the boiler, with the fewest possible joints in the feed pipe between it and the boiler. If it is a loose or swivel disk valve, it should be secured with solder (sweated in) in the threads of the double part of the disk, so as to make it almost impossible to lose the disk from the stem; a mark with a center punch or chisel is not enough. The valve should be so turned toward the boiler that the inflowing water will be under and against the disk, so that in the case of the loss of the disk it will not act as a check valve against the influx of the feed water. This arrangement will bring the pressure of the water in the boiler always against the stuffing box of the valve; but all things considered it is best.

The check valve should be close to and outside the feed valve, with only a nipple between them. Always use horizontal check valves, as they admit of easy cleaning. With the ordinary vertical check it makes it necessary to take down some part of the feed pipe to clean it.

When two or more boilers are fed from the same pump, or when the pump is used for pumping water for some other purpose, it is well to have a stop valve on each side of the check valve, as it will enable the engineer to get at his check without stopping the water to the other boilers or elsewhere.

In passing through boiler walls or cast iron fronts, care should be taken that the feed pipe does not nest, or the settling of the boiler will break it off.

Use a flange union on the feed pipe instead of the common swivel union; the engineer can take it apart with a monkey wrench, and it makes a more permanent job and it will not leak.

Never put a T in the feed pipe inside the feed valve for the purpose of a blow-off; make a separate connection to the boiler.

Blow-off Cocks.—Never use anything but a plug cock of the best steam metal throughout. The reasons for using a cock are that the engineer is always sure when he looks at it whether it is shut or open. It gives a straight opening; if chips, packing, or dirt gets into the cock it will shear them off when closing, or if it does not, the engineer knows it is not shut. Do not use an iron body cock with brass plug, for when the cock is opened to blow down a little the hot water expands the plug of the cock more than the body, and it is almost impossible to close it. Do not use a globe or angle valve, as you cannot always tell when it is shut; a chip or dirt getting between the disk and seat will prevent its closing. I have seen two fine boilers destroyed from this cause. Gate or straight-way valves are subject to the same objections as globe or angle.

When it is practicable there should be a T with a plug in it in the blow-off pipe outside the blow-off cock, the plug to be removed when the cock is closed. By this means the engineer can always tell if he is losing water from his boiler.

The blow-off pipe should be large, with few bends in it, and fire bends are better than elbows. It should be attached to the bottom of the shell of a horizontal boiler, and not tapped into the head a few inches up. When there is a mud pipe, attach it to it at the opposite end from the feed pipe.

Safety Valves.—They are the main stay of the engineer, acting both as a relief and a warning signal. They should be attached to the steam dome high up. At the side is better than the top, as they are not so liable to draw water when blowing off in that position. They should be large and have a large pipe connection all to themselves. The ordinary cross body safety valve is very much to be condemned, and I think in some countries there are regulations against their use; they are constructed to save making an extra connection for the main steam pipe, thereby drawing the largest amount of steam directly from under the disk of the safety valve. A weighted safety valve is better than a spring valve when it can be used, as the lifting of the valve makes practically no difference in the leverage; not so with a spring valve, for the higher it is lifted the more power it takes to compress the spring.

Gauge or Try Cocks.—Gauge cocks are various in style, the wood handle compression gauge cock being a very good kind for all purposes. When setting gauge cocks care should be taken that they are not too low, and that the drip will not flow over the person who tries them. They should be tapped directly into the boiler if possible; but when it is necessary to use a piece of pipe to bring them through a boiler front or brickwork, give the pipe an inclination backward, that the condensation may run back and into the boiler. When the pipe inclines outward and down, the condensation remains in it and the cock, and will deceive the unwary, giving the appearance of plenty of water with a short blow.

Glass Water Gauges.—Water gauges are best set when attached to a vertical cylinder at the front of the boiler. The cylinder should be connected to the boiler with not less than one inch pipe, top and bottom; the top or steam connection should be taken from the boiler shell near the front head, and not from the dome or steam pipe, as the draught of steam in either will cause the glass to show more water