THE ARTIFICIAL MANUFACTURE OF BUTTER.

The preparation of butter from substances other than cream, and by means other than the time-honored churn, is a subject which seems to be attracting considerable attention. With the view of presenting the fullest possible information on this interesting subject, we have obtained descriptions of various plans, for butter making and refining, patented in the United States, from which we are enabled to compile a comprehensive statement of the progress of invention in this direction. The extent of the topic necessitates its subdivision, and hence, in its consideration, we propose to treat it under the following heads: Manufacture of butter and shortening for culinary use from fats; manufacture of butter from whey; modes of purifying and improving butter; and, finally, butter-coloring compounds.

THE MANUFACTURE OF BUTTER, ETC., FROM FAT.

Taking the various processes in their chronological order, the earliest on record is the patent of H. W. Bradley, of Binghamton, N. Y., and is dated January 3, 1871. It consists in a mixture of refined vegetable or fixed oil, hog's lard or stearin, and tallow, heated and agitated with water by means of a current of steam. After a suitable length of time, the oil is drawn off and allowed to cool. This produces a purified grease, which may answer for some culinary purposes, but is hardly, we should imagine, palatable for table use. The same inventor, in a specification dated October 3, 1871, describes a mode of removing the offensive taste and smell from cotton seed oil, by adding one ounce of chlorate of potash and niter to each gallon. After heating and agitation, the oil is drawn off and treated with a current of pure oxygen, the effect of which is to deodorize and oxygenate it, rendering it, according to the patentee, sweet and palatable for cooking purposes.

The modest claims above noted are somewhat overshadowed by the numerous advantages which Dr. de la Perouse, of Paris, considers are obtained by his method of preparing fatty matters, patented November 21, 1871. He proposes to render fats, however rancid, neutral and pure—to produce a low priced cooking butter, which will always remain sweet—to give the prepared material improved digestible qualities—to preserve meat by enveloping it in unoxidizable fat—to make superior candle tallow, and, lastly, to mix liquid fat with flour of leguminous plants (peas, beans, etc.), or with chopped meat, to form a nutritive food. This last seems to be simply pemmican, an article of diet well known to the inhabitants of the northern part of this continent. The operation consists in placing a tun at a time of raw fat (beef, pork, or mutton) with distilled water, in which is dissolved a quantity of the sesquicarbonates or bicarbonates of oxide of potassium or aluminum. A solution of chloride of sodium or potassium is then added, and the whole boiled, first actively and then moderately, for several hours, when all the fat becomes separated from its cellular tissue. After a repose of two or three hours, the melted fat is passed into refrigerators, and thence into casks for the market.

Mr. Alfred Paraf's patent, which is next in date, April 8, 1873, is that under which the oleomargarin butter is made. This process has already been fully described on page 246, Vol. XXIX. of the SCIENTIFIC AMERICAN, but a brief review of its salient points will not be here out of place. The fresh fat, finely chopped, is mingled with its own weight of water at 120° Fah., at which temperature it is maintained for hours. The whole is then allowed to cool, when the mixture of congealed oleomargarin, stearin, and membrane is separated from the water and worked with common salt between cylinders, after which it is placed in bags and squeezed in a hydraulic press. This operation is performed in rooms at a temperature of 60° Fah., which is the melting point of oleomargarin, so that, by this means and by the mechanical contrivances, the latter is separated. It is finally reworked with salt, and churned into butter in the ordinary manner, with a proportion of buttermilk.

Mr. Joseph R. Brown, in a patent dated December 23, 1873, proposes to purify tallow, remove its smell, and render it hard and solid at all seasons of the year, by placing the substance in one fourth its weight of water, to which two per cent of strong sulphuric acid is added. This is heated to 200°, and the melted tallow, after an hour or so, is drawn into another tank in which there is a solution of alum. The temperature of 200° is again imparted, when air is forced into the mass for half an hour. Cooling then follows, and the water is drawn off. The tallow is lastly brought to 230°, and more air driven in, when, after settling, it is made up into suitable packages. Bleaching is effected by mixing chloride of sodium vapor with the air that is forced in.

A process which seems different from any yet described, and which is claimed to consist of artificially performing the natural functions of the lacteal system of the cow, when it absorbs its fat in order to transform the same into butter, was patented December 13, 1873, by M. Hippolyte Mége, of Paris, France. The first operation is to neutralize the ferments; and to this end the fat, as soon as the animal is killed, if possible, is immersed in a solution of sea salt and sulphite of soda. Crushing under millstones follows, and then artificial digestion, at a temperature of 103° Fah. This is accomplished by a compound of half the stomach of a pig and biphosphate of lime. When the fat is perfectly liquid, showing no lumps, more sea salt is added, and it is drawn off into water, at 86° Fah., contained in wooden tubs. Here most of the stearin is deposited in the form of teats in the middle of the liquid, which then goes to a hydro-extractor, or centrifugal machine, which effects the complete separation of oleomargarin and stearin. The former, says the inventor, is an excellent butter for kitchen use, but he improves it as follows: Cream, bicarbonate of soda, and the udders of a cow, chopped, are macerated and passed through a fine sieve. This mixture, wth coloring matter, is added to the margarin, which becomes thick, tastes like cream, and, when cold, is passed through large cylinders, which give it a homogeneous mass, and complete the production. When the butter is to be kept for long periods, water is substituted for cream in macerating the udder. The stearin is used for candles or may be saponified.

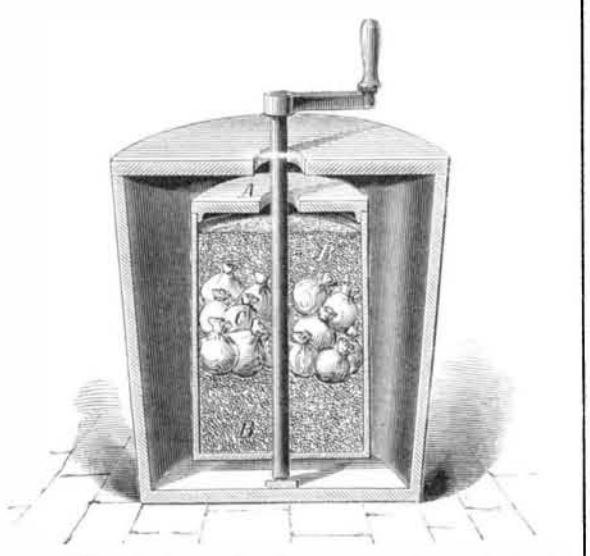
BUTTER FROM WHEY

is made by three processes. The first is that of Homer C. Markham, of West Turin, N. Y., and dated December 11, 1866. After cheese making, the whey is drawn off into a kettle, and to it is added dairy salt and a kind of acid made of old and sour whey. This is heated to about the boiling point, when the cream rises, is skimmed off, and, after cooling, is churned in the ordinary manner. The amount of whey given off by 450 pounds of milk will, it is stated with suitable proportions of the ingredients above mentioned, give three pounds of good butter.

Mr. James Suggett, of Cortlandville, N. Y., in a specification dated December 18, 1866, describes the second process, the first operation of which is to pass the whey into a cooling chamber which is surrounded with cold water. A solution of saltpeter, borax, and saleratus is added, and the whole left in the cooler for twenty-two hours, at the end of which time the cream, having risen to the surface, may be removed and made into butter.

Mr. Ira Page, of Adams, N. Y., patented June 23, 1868, the third process, in which the whey is allowed to stand 24 hours; and to the cream, which is then skimmed off, saltpeter is added. The butter obtained by churning is worked with salt and sugar.

There is another plan for butter making which, though not properly coming within the above sub-heading, may nevertheless be found worthy of notice and, doubtless, of trial. It is the invention of Mr. Adolphe Mot, of Washington, D. C., patented July 19, 1870; and we add a small engraving, which shows its construction. There are two

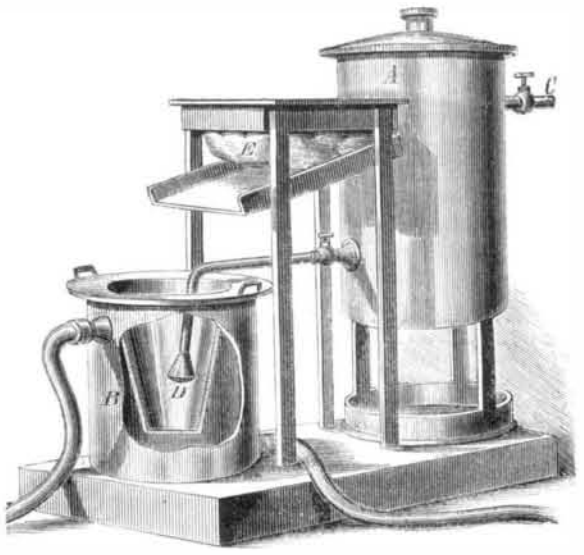


tubes, the inner one, A, of which may be revolved by suitable means within the outer. Within the tub, A, the sides of which are perforated, are placed, first, a quantity of pumicestone, baked clay, or similar porous substance, B, the cream, C, tied up in small bags, and, finally, more pumice. The effect of the latter is, after a few hours, to separate the buttermilk from the cream, leaving pure butter in the bags. Tub A is then revolved, and the liquid is projected through the perforations into the outer vessel, and, lastly, water is added for washing purposes, which is got rid of in a similar manner.

We now pass to the

REFINING AND PURIFYING OF BUTTER.

Mr. D. H. McGregory, of Detroit, Mich., patented (September 10, 1867) a process which consists in adding to one pint of milk, fresh from the cow, the yolks of two eggs and a pound of poor butter. This is churned, salted, and worked in the usual way, producing, it is stated, two pounds of fresh wholesome butter. Mr. Joseph Sigler, of Anderson, Ind., in a patent dated November 5, 1867, proposes a somewhat similar operation, churning together 1 gallon of sweet milk, 1 ounce of loaf sugar, 20 grains of nitrate of potash, 1 ounce of liquid rennet, and 10 grains of annatto, with 8 pounds of butter. The weight of the resulting compound is not given. Louis S. Robbins, of New York city, suggests, in his patent of July 28, 1868, that butter, after churning, will be less likely to turn rancid if heated to a semi-liquid condition, and then washed, first with warm and afterwards with cold water, so as to remove the buttermilk and other impurities. Butter already rancid, according to the patent of Mr. Calvin Peck, of Marshal, Ill., dated November 20, 1869, may be restored and purified by adding two ounces of pulverized alum to every five pounds of butter, the latter being melted. The butter, while still liquid, is passed through a fine sieve into clear cold water, from which it is removed and worked with dairy salt, saltpeter, and sugar. We add an engraving of the apparatus recently devised by Mr. George Kirchhöffer, of Chicago, Ill., and patented June 10, 1873. A quantity of butter in a melted condition, is put in a reservoir, A, its temperature being kept between 100° and 120° Fah. B is the congealer, which is filled with milk or buttermilk, and through the hollow sides of which a current of cold water is maintained so that the temperature of the milk is retained between 55° and 65° Fah. Pressure is next applied to the surface of the melted butter in the reservoir, through the pipe, C, and, a valve being opened, forces the butter down through the tube, D, and out of the perforated nozzle at its end into the cold milk. The congealed particles, after being skimmed, are thrown into a filter, E, through which the milk escapes and runs down the inclined trough, back into the congealer. The butter is subsequently worked in the ordinary way.



Different from any of the above plans, and apparently much simpler, is the process patented by Mr. Josiah W. Prentiss, of Pultney, N. Y., October 4, 1859. It consists simply in removing the hoops from the firkin, A, containing the spoiled butter, placing it in a bag, B, and burying the whole in charcoal, C, contained in a barrel or other receptacle. The illustration shows the arrangement, and necessitates no further explanation. Two

COMPOUNDS FOR COLORING BUTTER

have been made the subjects of patents. One, devised by Mr. D. W. Dake, of Brooklyn, N. Y., consists in adding annatto to pure oil obtained by melting the butter. The annatto is mixed mechanically with the liquid, and produces a compound of a reddish golden color, 75 pounds of oil to 5 pounds of annatto being the proportions. One or two pounds of the coloring matter suffice for 100 pounds of butter. Messrs. Bogard, Cramer & Lewis, of Laporte City, Iowa, patented September 16, 1873, another coloring compound composed of annatto, 5 ounces; curcuma, pulverized, 6, ounces; saffron, 1 ounce; lard oil, 1 pint, and butter, 5 pounds. It is said that the amount of coloring thus obtained is sufficient for 5,000 pounds of butter.

The Suez Canal.

It has been proposed that the European Powers should buy the Suez Canal, and throw it open for the benefit of the whole world of commerce. The present dues levied by the company, it is stated, are absolutely prohibitive against the greater portion of the imports and exports on both sides of the canal; and a recent increase which has been made, of some 43 per cent on the original charges, on the basis of tunnage, operates to shut out small vessels and heavy goods. Each country, it is suggested, should contribute a certain quota of the purchase money, to be estimated by a determination of the amount of benefit which each individual commerce would receive by the enfranchisement; and by this means, the entire estimated amount of $70,000,000 (at par, and without interest), it is said, could be collected. Vessels in such a case would be required to pay only such dues as would aggregate sufficient for the simple maintenance of the work, and not be heavily taxed as at present for the accretion of large dividends. It is believed that the commerce of the world would thus be immensely benefited.

Light Draft Iron Steamers.

A paper by Mr. Theodore Allen, on "Iron Hulls for Western Steamers," has lately been published in the "Transactions of the American Society of Civil Engineers." Mr. Allen is about to remove to the west, to test by practice the correctness of his theories. We give a brief summary of the paper:

In England, steamers are constructed almost exclusively

of iron; and in this country, the proportion of iron to wooden steamers, now in process of construction, is as 21 to 4.

The first iron vessels were built in the same general manner as wooden ones, with iron ribs and sheathing. It soon became evident, however, that the same strength could be secured with much less material, by building vessels in the same manner as beams are made, and hence the introduction of the longitudinal system. This system has now been generally adopted in England for light draft vessels.

In this country, iron vessels have generally been constructed on the transverse system. The vessel proposed by the writer for service in western waters is to be built on the longitudinal system; and the bottom sheathing, to ensue great elasticity for resisting shocks, is not secured to the transverse bulkheads or frames, the connection of the bottom plates being made exclusively to the longitudinal frames. A comparison of this proposed vessel with a wooden steamer of the same general dimensions, is as follows:

	Iron vessel. Tuns.	Wooden vessel. Tuns.
Hull	147	270
Deck	112	112
Machinery and wheels	93	93
Water in boilers	20	20
Joiner work	40	40
Fuel, fittings, etc	25	25
The total weight	437 tuns	560 tuns
Mean draft	26 inches	32 inches
Cost complete	$100,000	$85,000
Durability	20 years	10 years
Value at the end of this time	$20,000	$15,000
Annual depreciation during service	$4,000	$7,000
Freight carried on mean draft	658 tuns	535 tuns
Net profit finally	$22,137	$14,250

A New Use for Chicken Feathers.

Chicken feathers are among those waste products of the farm of which no regular means of utilization has heretofore been suggested. Myriads of them are strewn over the barn yard, packed into the floor of the chicken house, or are converted into positive nuisances by the wind which bestrews them over lawns and flower beds, or drives them into open doors and windows. The down alone is, we believe, occasionally used as a stuffing for pillows or cushions, and sometimes employed as an adulteration in goose feathers; but the long plumes of the wings, sides, and tail of the bird, unless made into rude bundles to serve as dusters for the housewife, are generally regarded as totally worthless.

"According to statistics very carefully compiled," says a writer in *La Nature*, "we throw away yearly a quantity of chicken feathers, the intrinsic value of which is equal to the money which we pay out for cotton." A startling statement, but the author considers it true; and he proceeds to explain how the feathers are prepared to render them valuable: The operation is to cut the plume portions of the feathers from the stem, by means of ordinary hand scissors. The former are placed in quantities in a coarse bag, which, when full, is closed and subjected to a thorough kneading with the hands. At the end of five minutes, the feathers, it is stated, become disaggregated and felted together, forming a down, perfectly homogeneous and of great lightness. It is even lighter than natural eider down, because the latter contains the ribs of the feathers, which give extra weight. The material thus prepared is worth, and readily sells in Paris for, about two dollars a pound. About 1·6 troy ounces of this down can be obtained from the feathers of an ordinary sized pullet; and this on, the above valuation, is worth about 20 cents. It is suggested that, through the winter, children might collect all the feathers about a farm, and cut the ribs out as we have stated. By the spring time a large quantity of down would be prepared, which could be disposed of to upholsterers, or employed for domestic uses. Goose feathers may be treated in a similar manner, and thus two thirds of the product of the bird utilized, instead of only about one fifth, as it is at present the case.

The chicken down is said to form a beautiful cloth when woven. For about a square yard of the material, a pound and a half of down is required. The fabric is said to be almost indestructible, as, in place of fraying or wearing out at folds, it only seems to felt the tighter. It takes dye readily, and is thoroughly waterproof. There appears to be a good opportunity here for some ingenious person to invent machines to cut and treat the feathers.

Bergen Hill Tunnel.

Work on the Bergen Hill tunnel, for the Delaware, Lackawanna and Western Railroad, has been lately commenced in earnest. Seven shafts are to be sunk, and 500 men kept at work day and night. The tunnel begins on the east side at the foot of Ferry street, Hoboken, and will be considerably above the Erie tunnel. The track will be elevated above the Erie road, at the west end, on a trestle, thus avoiding the danger and delay of crossing. It will take two and a half or three years to complete the tunnel.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

From January 14 to January 15, 1874, inclusive.

ENGINE, PUMP, ETC.—W. D. Hooker, San Francisco, Cal.

FILTERING LIQUIDS, GASES, ETC.—T. R. Sinclaire, New York city.

GRINDING MACHINE.—C. Heaton, New York city.

MAKING SCREWS, ETC.—E. Nugent *et al.*, Brooklyn, N. Y.

DECISIONS OF THE COURTS.

United States Circuit Court---Northern District of Illinois.

SHINGLE MACHINE PATENT.—HARRY H. EVARTS *et al. vs.* DAVID M. FORD.

[In equity.—Before Blodgett, District Judge.—Decided November 26, 1873.

This suit was brought to recover damages for an alleged infringement of a patent for an improvement in shingle machines, issued to H. H. Evarts, dated October 1, 1854, and extended for a term of seven years from October 1, 1868.

The court held substantially as follows:

A claim for "presenting the sides of the fibers of the wood to the action of the saws in the sawing of shingles or equivalent articles, for the purpose of giving them smoother surfaces than can be produced by the usual mode of sawing, if construed literally, asserts a right to a result, and cannot be sustained.

But if read as it should be with the specification, and interpreted to embrace the mechanism therein described, by which the result is accomplished, it is a valid claim.

A patent for a machine, in which a shingle bolt is automatically fastened by dogging teeth upon a rotating carriage which presents it sidewise to the action of a circular saw, is not infringed by a machine in which the bolt is by hand fastened to a reciprocating carriage and shoved up to the saw.

No recovery can be had upon a patent for using a machine which is neither described nor claimed in it, although the machine was originally devised by the patentee in the course of experiments which resulted in producing the patented machine, and although it has been the most extensively adopted.

If the patentee omits to notice in his patent the intermediate machines he produced in the course of his experiments, he must be presumed to have abandoned them.

The opinion of the Commissioner of Patents granting an extension is entitled to great consideration on the question of novelty, but not on a question of infringement.

Bill dismissed.

L. L. Coburn, for complainants.

West & Bond, for defendant.

United States Circuit Court---District of Massachusetts.

PRINTING PRESS PATENT.—CYRIL C. CHILD *vs.* BOSTON AND FAIRHAVEN IRON WORKS.

[In Equity.—Before Shepley, Judge.—Decided January 1, 1873.]

Letters patent No. 98,087 were granted December 21, 1869, to Charles Montague, assignee to Cyril C. Child, the plaintiff, for improvement in printing presses. This invention consisted—

1. In the use of a vibrating lever for moving the type bed, constructed in two parts, one of which is made to slide out and into the other somewhat like the joints of a telescope, so that the upper end of the lever may be attached directly to the under side of the bed (dispensing with the use of a link) and move in a direct line with the bed, the upper portion of said lever moving out of or into the lower portion, as the distance of the fulcrum of said lever to the point of attachment to the bed is greater or less in the different parts of the movement of the bed.

The plaintiff's claim is for the extensible vibrating lever in combination with a reciprocating type bed substantially as described.

Defendants admit the manufacture and sale of printing presses containing the extensible vibrating lever in combination with a reciprocating type bed, as described in complainant's patent.

The answer sets up in defense that Montague was not the original and first inventor, and also that the invention set forth in the plaintiff's patent had been in public use more than two years before the application of Montague. To sustain the defense of prior knowledge and use, respondents undertake to prove that one B. F. Leonard was the inventor. Leonard was in the employ of the respondents as their superintendent at the time that they constructed for Montague the first printing press known by the name of the "extension press," which embodied the invention of the extending vibrating lever in combination with the reciprocating type bed. This press was made for Byington & Company, and was used in printing the Norwalk *Gazette* in the summer of 1867; and it is clear from the evidence in the record that Montague had conceived the idea of substituting the extensible vibrating lever for the lever and link connection previously used as early as 1865, and had made drawings in that year clearly describing the invention, although, from the opposition he encountered from respondents, who were then building his presses under contract with him, he did not embody his invention in a practical working machine until the press was made for Byington & Company in 1867. Leonard never seems to have claimed to have been the inventor of this improvement until January, 1869, when he represented in his caveat that he had made certain improvements in mechanism for operating the platen of a printing press, and that he was then engaged in making experiments for the purpose of perfecting the same. This caveat he prepared and made oath to, but never filed in the Patent Office. This was more than three years after Montague had exhibited to two or three persons his drawing representing his improvements, and a year and a half after the respondents had made for Montague the Byington press. The testimony is conclusive that this is only one more of the too frequent instances in which a person, engaged as a mechanic or constructor in embodying the inventor's idea in a material form, attempts to prove that he was the first inventor because he made or aided in making the first machine.

The Judge held substantially as follows:

More than three years after the patentee had shown a drawing of his invention to several persons, and a year and a half after it had been embodied for him by the respondents in a working machine, a workman of theirs described it in a sworn caveat, which was never filed, and this was held not to impeach the plaintiff's claim to novelty.

An old combination employed in a new organization, and producing a new result by a new mode of operation, is patentable.

The plaintiff's patent was for a printing press in which an equable and regular reciprocating movement was given to the platen automatically by means of a lever driven by a crank, and having a telescope joint by which its length was accommodated to its position, and the patent was sustained, although, in a previous machine for rolling bayonets and the like, a gage was forced back by a cam or die, and carried with it two levers of the same character, which compressed a spring or raised a weight, and this when released carried forward the lever and the lever the gage, the movement not being regular, and otherwise not suitable for a printing press.

The patent held valid also for similar reasons, although the patentee had for two years previous to applying for it manufactured and sold printing presses in which a reciprocating movement was given to the platen by a lever attached to it by a link.

The patent adjudged to be good and valid, and decree for complainants for injunction and account, as prayed for in the bill.

E. P. Brown, for complainant.

T. M. Stetson, for defendants.

NEW BOOKS AND PUBLICATIONS.

HUSSEY'S NATIONAL COTTAGE ARCHITECTURE, or Homes for Every One. By E. C. Hussey, Architect. Price $6. Published by George E. Woodward, and sold by Orange Judd & Co., New York.

This work is a collection of sixty-three plates of pleasing and tasteful architectural designs for suburban homes, ranging from the modest cottage to ornate and handsome villas. The drawings are accompanied with full details, estimates of cost, hints as to construction, specifications, and enough general descriptive matter to enable the searcher for an appropriate plan for a projected dwelling to determine at once whether any in the pages before him will or will not meet exactly his requirements. A table of prices of building materials is added. The volume is elegantly printed on toned paper, and the plates are executed in the best style of lithography. Altogether, it is a useful and attractive book for residents in the country contemplating building. It seems to possess more originality in its designs than any work of its kind lately published.

AN ELEMENTARY COURSE OF PERMANENT FORTIFICATION. By D. H. Mahan, LL.D. Revised and Edited by Brevet Colonel J. B. Wheeler, Professor of Military and Civil Engineering, United States Military Academy. Price $6.50. New York: John Wiley & Son, 15 Astor Place.

Professor Mahan's text books on civil engineering and field and permanent fortifications are so widely and generally known that it is unnecessary to allude to the volume before us, other than as a standard work of its class. The reviser, in the new edition, has supplied several alterations and omissions in the original text, and made various necessary improvements. Prominence is given to the bastioned system over others, as it is considered as having best withstood the test of experience, and Noizet's method is carefully explained. The book is used for instruction at West Point. A large number of lithographic plates are supplied, together with the regular engravings in the text.

A TREATISE ON ASTRONOMY, SPHERICAL AND PHYSICAL, with Astronomical Problems and Tables. By William A. Norton, M. A. New York: John Wiley & Son, 15 Astor Place.

The fourth edition of this standard work appears in an entirely remodeled form, with many of its most important chapters wholly rewritten, and is, in brief, a complete exposition of the present condition of the science of astronomy from both a theoretical and practical point of view. The results of recent investigations concerning the physical constitution of the heavenly bodies are given in full, together with the author's own researches on the sun and the comets. A new and more accurate mode of determining the sun's parallax and mean distance from the earth is presented for the first time in an American treatise, and a description is also added of the astronomical observations for finding the latitude and longitude of a place as cited by the United States Coast Survey. A number of valuable tables, together with several new illustrations, conclude the volume.

ART CULTURE, a Handbook of Art Technicalities and Criticisms, selected from the works of John Ruskin. Arranged and supplemented by Rev. W. H. Platt. New York: John Wiley & Son, 15 Astor Place.

As indicated by its title, this work is a compilation from the original and exhaustive writings on art criticism which have been given to the world by perhaps the greatest living art critic. It is intended for educational purposes, and aims to give the student a thorough appreciation, based upon the correct principles of a true and refined taste, of the handiwork of the painter, the architect, and the sculptor. There is enough of the technica in the volume to render it a valuable guide to the artist, and many chapters notably those on color, light, perspective, sketching from Nature, &c., are eminently practical and clear in direction and precept. A profusion of admirable illustrations, mainly extracted from the complete works of Ruskin, are interspersed, and serve materially to elucidate the principles laid down in the text. A glossary of artistic terms and an alphabetical index of artists, sculptors, and architects referred to, are added. Press work and binding are alike excellent.

Recent American and Foreign Patents.

Improved Mole Trap.

Robert I. Huggins, Bethel, O.—To locate the trap, the earth is pressed gently down, so as to fill the burrow, and the trap is set directly above, with sill pieces parallel with the burrow, and with a cross piece on such depression. The mole, finding its hole obstructed, will commence repairing damages, and in forcing its body through the old track the cross piece will be raised, which raises a rod, and this, acting on a lever, releases a cross head which drops with its teeth on each side of the cross piece. The teeth penetrate the ground and spear the mole.

Improved Windlass and Crank for Brakes.

Henry M. Howard, Brooklyn, assignor to John Stephenson, New York city.—The windlass, around the lower end of which the brake chain is wound, is made polygonal, with the upper end reduced in size with a loose collar placed thereon, which is kept in position by a screw nut. The crank has two pairs of jaws. The former is made to fit two opposite sides of the windlass, and the latter are attached, by swivel pins, to the loose collar By raising the outer end of the crank, the jaws will be detached from the windlass and the crank may be turned round to allow the jaws to engage with any other two of the sides of the windlass. By this means the driver is enabled to take a hold of the windlass that will allow him to exert the required strength to the best advantage. When the brake is not in use, as, for instance, when the car is reversed, the crank may be thrown over so as to hang out of the way.

Improved Sash Fastener.

John G. Spathelf, Sandusky, O.—This invention consists of a casing with bolt and lever arrangement, which catches into recesses of the window frame, and is withdrawn by pressure of the finger upon it, returning into the original position by a suitable spring. On releasing the button, the action of the spring will force the lever into the next recess, fastening thereby the window at that point.

Improved Road Scraper.

Thomas M. Tate, Longview, Texas.—This invention relates to means whereby road scrapers may be loaded with more facility, drawn with less expenditure of muscular power, and made to perform an increased amount of work in a given time. The invention consists in combining with a road scraper two front wheels, movable, to let them below or carry them above the bottom of scraper; in end-angled levers, having journals and fulcrum pivots combined with wheels and bearings in the sides of the scraper; in levers connected by a bar and combined with shoulders on scrapers, and a spring latch working therethrough: and in combining with the latch, held forward by a spring, a cross bar and arm of the latch lever.

Improved Lantern.

Joseph Kintz, West Meriden, Conn., assignor to himself and P. J. Clark of same place.—The object of the construction is to facilitate insertion and removal of globes and clamping or securing them between the base and top of the lantern. The vertical guards are hooked into the top through holes in the sides so that the top can swing sidewise. They are also hooked into the bottom in slots, so that they can move up and down in them to some extent. The guards are so adjusted as to length that, when down to the lower ends of the slots, the globe will rest on its seat and the top will rest on the globe, and when they are raised up in the slots as high as they will go, the top will swing off or on the globe. They are to be pressed down by inclines, formed by notching a ring which is fitted around the bottom of the lantern, and adapted to be reciprocated to fasten or unfasten the globe by acting upon the guard wires. The horizontal guards are connected to bent pieces, and the latter are arranged so that they will slip down on the vertical guards and hold fast at the bulge so as to hold the horizontal guards in place, and, at the same time, stiffen the bottom, globe, and top against lateral motion.

Improved Car Coupling.

Frank A. Markley, Waynesborough, Va.—This invention relates to car coupling generally, but more particularly to that class of them in which is employed a link with spring grapple at each end. The invention consists in pivoting the spring catches to the hook piece as nearly as possible in the same transverse median plane, in order to shorten the coupling link, and allow the cars to come as closely together as possible. It also consists in arranging a projection at one side of the rear concavity of link slot, so far as to arrest any lateral pressure of pin against the spring latch, and thereby prevent any chance of accidental uncoupling. It also consists in using slight side latches, and thus throw the main weight and strength of the metal into that part of the link which is expected to take the strain.

Improvement in Boots and Shoes.

James McMillin, Ripley, O.—This invention contemplates the use of a wedge as a remedy for the tendency which so generally exists to wear the heel of a shoe or boot on one side. If the tendency is to wear out the subjacent edge of heel on the inner side, the thicker part of wedge is caused to abut against the corresponding side of the upper, thus throwing the strain toward the center, and not only preventing the edge wear on heel, but tending gradually to correct a slovenly habit of twisting the ankle when the weight is pressing thereon in standing or walking. If the wear should be usually on the other side of the heel, the wedge piece is reversed in position, and is in like manner productive of the same result.