Correspondence

The Distillery Business--Saccharification.

[Continued from page 150.]

Of no less importance than malting, as described in my second article, is the process of saccharification, commonly called mashing. Upon its correct management mainly depends a good yield of whisky, however much the superficial practice of some distillers would lead one to think the contrary.

Starch, or the amylaceous matter of the grain, must be saccharified first; and the sugar thus formed is the basis for the subsequent transformation into alcohol (whisky). The transformation of the starch into sugar takes place by degrees, it having first to be transformed into a peculiar kind of gum, called dextrine, and afterwards into sugar. The very small particles of starch, whose natural sizes vary from $\frac{1}{500}$ to $\frac{1}{10000}$ part of an inch, are composed of many concentric strata or shells, in the shape of an onion, enclosing a kernel. Dried starch exposed to a temperature of 234° Fah., first turns gray, then yellow, then brown, and. when exposed to still higher degrees, will be carbonized. The concentric strata of starch will burst when boiled or scalded with water, and all parts of it are then fully developed (dextrinified) and ready to be exposed to the reaction of the diastase. If one pound of sulphuric acid be added to 100 pounds of water, and starch is then boiled in it, the solution gradually acquires a sweet taste, and ultimately the whole of the starch is converted into grape sugar. If the acid be then neutralized by an alkali—that is to say, separated by the absorption of chalk from the fluid, and the remaining liquor boiled down, a rich sirup or sugar will be obtained. But, for many good reasons, we do not use any acid in converting starch into sugar for distilling purposes. Instead of it, we use diastase (malt). Diastase does not affect raw starch in any way, but it reacts on scalded or developed starch (dextrine).

The grain must be ground first to destroy the adhesiveness of the principle of the grain; and the finer and more uniformly the grain has been ground, the more extensive surface of the starch or the greater number of particles of it will be exposed to the solvent action of the scalding water, and afterwards to the reaction of the diastase—the more complete, in other words, must be the dextrinification and saccharification. To make it possible to convert all dextrine into sugar, a certain quantity or proportion of diastase (malt) to the grain is necessary. The better the quality of the malt, the less of it is required; the richer the grain, the more malt is necessary. Some distillers do not take these circumstances into consideration or remember that a coarsely-ground meal must be scalded at a higher temperature, while a finely ground meal requires a lower degree of heat to be dextrinified. Hence, one portion of meal, of grain not uniformly ground, will be scalded too much, while the other part of it will often be too little scalded. Here I may mention that the meal never should run warm from the millstone, as such practice will destroy the property of a greater part of the starch to be saccharified.

But diastase is not the only requisite for the process of saccharification. A certain proportion of water to the dry substance, certain well defined degrees of temperature and a sufficient length of time, are required as well for the transformation of starch into dextrine as for the transformation of the latter into sugar. If one or the other, or all of these conditions are not complied with, neither a perfect dextrinification nor saccharification can be expected, and, as a necessary consequence, there cannot be a good yield. Suppose we were to use a wrong proportion of water, that is, more than four parts to one pound of meal, then, as a consequence, the mechanical and chemical processes would be disturbed, and there would be either too much or not sufficient room for the action of the diastase and fermentation. The reader will find in my next article that fermentation is caused by very small organized beings, a species of fusoria, and this explains what we say here, that too large a proportion of water must prohibit a good fermentation. Besides, a thicker beer is more fit for keeping the temperature unaltered by external influences, and as the whisky obtained by the fermentation of a rich, thick beer is more concentrated, acetous fermentation cannot set in so easily.

Suppose, again, we should not observe the proper degree of temperature—150° Fah.—then the saccharification would be restrained, and we should produce more gum than sugar; or, by using too high a temperature we should destroy at least a part of the saccharifying property of the diastase; producing merely a large quantity of gum. By not allowing the required time for the action of the diastase—at least one hour and a half—we should intercept the process of saccharification; while, if we were to use less than the necessary quantity of malt, all dextrine could not be converted into sugar. Nothing short of a simultaneous compliance with all the conditions mentioned can insure perfect success or, in other words, secure a good yield.

In many distilleries I found that steam was introduced into the mash tub by means of a pipe, for the purpose of scalding (dextrinifying) the starch. The following explanatory remarks will show how wrong this practice is:—

Water exposed to the most intense heat will never rise to a higher temperature than 212° Fah., because the escaping steam is the very vehicle which leads off the higher degrees of heat. But this steam retained, as, for instance, in a boiler, will absorb or swallow up the higher degrees of heat, although, when it escapes, it will never, even under the greatest possible pressure, show on the thermometer a higher temperature than boiling water, *i.e.*, 212° Fah. Steam in a compressed state, then, contains the higher degrees of heat "bound up;" that is to say, it contains a latent heat, which cannot be indicated by instruments. Steam let out from boilers of high pressure, as found in distilleries, with an average capacity of from 80 to 90 pounds, will carry of a heat from 300 to 400 degrees, and the effect of such a temperature coming in contact with starch in the mash tub can be easily imagined, when, as we have already seen, even 234° Fah. change the quality of the starch—that is, spoil it and make it unfit for dextrinification. In this case the starch will not only be scalded, but backed, and consequently lost for saccharification. There is but one correct way of dextrinifying starch for distilling purposes, and that is by means of boiling water.

The above remarks will suffice to show how great attention and how much knowledge and care is required by the distiller in order to insure safety and success to the process of dextrinification on saccharification, or, as it is more generally called, mashing.

[To be continued.]

Odors.

MESSRS. EDITORS:—M. Piesse, of London, believes he has discovered a gamut of odors; why may not those prosecuting inquiries in this direction find the original odors? As there are a very few primitive colors, of which all others are composed, so there may be a limited number of elementary odors which, combined in various proportions, produce the variety we meet with in nature. The rose and a species of the peony have precisely the same fragrance. According to M. Piesse, the rose-geranium is an octave below. The sweet shrub or calacanthus has the identical scent of an early ripe apple. The heliotrope and vanilla, the Persian lilac and nutmeg, the gillyflower and clove, the jasmine, lily and tulip, are other instances. Mignonnette, grape flower, spirits of turpentine, and white raspberries, have the same odor, but in different proportions. It has been observed by cooks that, when too large a quantity of the oil of lemon was used, the flavor of the dish was no longer lemon but turpentine. Quinces, in a certain state, have the flavor and odor of the onion.

This identity of odor is not confined to the vegetable kingdom; the musk and musk-plant, the oyster and oyster-plant or salsify, the animal known to naturalists as the *mephitis Americana*, and the crown imperial, are obvious illustrations to the contrary. Who can say that in our future botanical works the essential oil scenting the flower will not be included in the description? L. G. S.

Erie, Pa., Feb. 28, 1863.

Fine Steel made in Pittsburgh.

MESSRS. EDITORS:—My attention has been directed to the article in the last number of your valuable journal on the subject of "American Steel." While you award the credit of success to the manufacturers of steel west of the Alleghanies, you seem to labor under a wrong impression in regard to the measure of that success, and especially in this city.

After confining the results here to the fabrication of the cheaper sorts, in which you admit it to be of equal quality, while its cost is less, you say "all the finer sorts of steel, however, are imported in great quantities from England." This is a mistake. There are at this time no less than five different establishments in this city alone engaged either in whole or in part in the manufacture of the best description of cast steel for edge tools, fine cutlery, &c.; and the largest of these is exclusively devoted to the manufacture of best cast steel, with eminent success, as is clearly proved by the fact that some of the largest manufacturers of edge tools, table cutlery, reapers, skates, saws, files, &c., in New England obtain their principal supply from that concern. New York and New England are large customers for Pittsburgh best cast steel; and wherever it has been introduced, its superiority over imported English steel has been demonstrated, and it is preferred at the same price.

This steel is sold at a lower price, not because of its being of an inferior quality to the best English brands, but because it can be afforded at less and still yield a satisfactory profit to the manufacturer. If you desire testimony from consumers, I will take great pleasure in furnishing you with a "cloud of witnesses" to attest all I allege in favor of the quality of best cast steel made here.

I forgot to mention before that, besides those engaged here in the manufacture of best cast steel, there are at least as many more who confine their operations to the production of the commoner descriptions of steel. In magnitude, several of our steel concerns will compare favorably with their English rivals.

Believing that you would not willingly inflict a wrong upon so meritorious a class as the steel converters of this country, I have taken this means of correcting your impressions, and hope you will do us the justice to make the correction.

JAMES M. COOPER.

Pittsburgh, Pa., Feb. 28, 1863.

[We are certainly much gratified to learn that the business of manufacturing from steel has obtained a good foothold in this country, and we wish it success. Not long since we were told by an extensive wire manufacturer in New England that he could not obtain American-made steel good enough for his use, and he urged on us the importance of stirring up our manufacturers to produce better qualities. The business of steel-making is one of great importance and ought to engage increased attention. We do not feel willing to depend upon any foreign nation for a single article of prime necessity, whenever it can be produced in this country. We would like to enquire of our iron manufacturers if they are able to produce an article of iron fit for gun barrels? And, if not, why not? We were informed a short time since by a manufacturer of fire-arms that he was obliged to depend upon the English market for his iron, and that the Springfield musket barrels were made from Marshall's iron, imported from Birmingham, England.—EDS.

Sorghum Cane and Sugar.

MESSRS. EDITORS:—In your issue of January 10th you refer to a convention of the manufacturers of sorghum and imphee sirup and sugar, which was held at Rockford, Ill., in December last, where I am reported as relating "some very useful experience." As that report is meager, and as you invite your readers who have been successful in making sorghum sirup, to communicate their processes for the benefit of the public, through your columns, I think this new and important branch of agricultural industry will be advanced by giving you the process by which I have manufactured several hundred weight of sugar like the sample I now send you. This is in a crude state, just as it granulated in the sirup, standing in an open vat. I also send you a sample of the sirup. But to the process:—

The juice is expressed through iron rollers, and evaporated in a series of pans, by a process patented by myself (Patent No. 35,350) known as "Moss & Williams's Oscillating Evaporator." The juice flows into the front end of the first pan, or the one directly over the fire. A reservoir should be provided to receive the juice from the mill, which should hold enough to provide against inconveniences from any temporary stoppages of the mill. The boiling should not be stopped until the day's work is finished. The juice should run into a box twenty inches square, filled every morning with clean straw; this makes a good filter. The reservoir should be placed high enough to run the juice into the first pan. A faucet should be two inches or more from the bottom of the reservoir, and the flow so regulated as to furnish juice only as fast as it is evaporated. The constant stream of cold juice keeps the front end of the pan below the boiling point, and makes a defacating space sufficient for the removal of the scum, which by the ebullition will accumulate there; this green scum should be removed from the first pan, and may be done every half hour and even less frequently. Dip from that part of the first pan which is boiling into the second pan, taking care to keep in this pan a quantity sufficient to supply the third or finishing pan. Dip from the second into the finishing pan at once enough to make from two to four gallons of sirup, so that no more will be required until this is finished and discharged into the cooler. The juice in the first pan should never be more than an inch in depth, and in the second and third there should be just as little as can be conveniently operated, for the thinner the film of juice the more rapid the evaporation and the better the product. When the evaporation is about half completed, or at 225°, a mucilage arises, which is not separable at a lower temperature, this, with the scum from the finishing pan, should be removed. When the charge in the finishing pan begins to boil there will arise a brown scum, which should also be removed. The rocking of the pan should then commence, and be continued unremittingly until the process is completed, keeping the sirup boiling all the time. The more rapid the operation the more satisfactory will be the product, and the hotter the fire the better, for the rocking prevents the burning, as each particle of the sirup is brought in contact with the bottom of the pan. The sirup cannot be burned until the process is finished, for the whole mass is equally heated, and the heat required for finishing the sirup, viz 238°, is below the point at which the sirup will burn Lift the pan from the arch and empty into the cooler, which should be a shallow vat, and stir occasionally until cool.

But little crystallizable sugar is obtained from the upper joints of the cane, though all may be ground together, as working a part at a time increases the labor, without very materially changing the results. There is no difficulty (with ordinary skill) in making good sugar from ripe and excellent sirup from unripe cane by the above process. The pans should be thoroughly cleansed each day. Good dry wood is indispensable in making sugar or first-rate sirup. In a room at an ordinary temperature, in open vats, granulation commences in from one to ten days, though it may not be completed—that is, the whole mass may not become sugar—before as many months. If, however, the cane was ripe, the boiling rapid, and the operation conducted as above, good sugar is certain.

J. M. Moss.

Waverly, Iowa, Jan. 26, 1863.

An Extraordinary Mode of Defending Harbors.

Messrs. Editors.—In the last number of the Scientific American received here (Jan. 3d) you stated that you wished to receive some suggestions relating to harbor defenses. I herewith give you an idea which may or may not be practicable; of this I leave you to judge:—Supposing the entrance into an harbor to be narrow, and a good fort or other stronghold to be in the neighborhood, with a convenient place for a steam engine; from this lay down pipes of from three to six inches in diameter, directly across the channel where the vessels have to pass; the pipes are provided with several valves, so that no water can enter them. When required, fill the pipes with native distilled *coal oil* or other hydro-carbon liquids; then apply a force pump at the end nearest to the fort and force through the pipes a continued stream of oil, which, by the pressure, opens the valves and discharges the liquid oil. This oil being lighter than the water, floats to the top, and can then be set on fire, either by Congreve rockets thrown from the land or by a preparation which, together with the oil, is forced through the pipes and would ignite when coming in contact with the air. There may be also forced through the pipes a quantity of small explosive shells which would do some service. The ignited oil will not only set the combustible parts of the ships on fire but will create such a dense and unpleasant smoke as to blind and suffocate officers and crews on board the vessels. I have been once in the midst of the fire and smoke of burning petroleum; and therefore I know that any one who has once experienced its horrors will never wish to be surrounded by it a second time.

J. M.

Dolgelly, North Wales, January 24, 1863.

Frictional Gearing.

Messrs. Editors.—As the subject of frictional gearing is exciting considerable attention just now, I am induced to give your readers an idea of an application of smooth-faced friction wheels which were once used at a woolen factory at Wotton-under-edge, Gloucestershire, England, in which I was at that time (1803) employed. Among others was a machine we called the gig-mill which carried the teazles for dressing the face of the cloth. It was driven with a varying force of from two to twelve horse-power, and required to be stopped and started a great number of times to change the teazle, &c. It was worked by a pair of what we called friction wheels, the rings being built of segments of wood to a thickness of square of 5 or 6 inches and a diameter of 4 feet 6 inches. As they were continually wetted by the spray from the cloth they were not very durable still they worked well for many years. These wheels worked on horizontal shafts in a line with each other—one shaft sliding in its bearings endways and having a lever attached, or it might be slid on the shaft causing it to retire from and approach the other. The faces of the wheels were smooth, and when pressed together the adhesion was sufficient to drive the machine above-mentioned. Some eight or ten years after an improvement was made by using cast-iron wheels some 2 feet 10 inches in diameter and weighing perhaps 550 pounds. The square edges of the driving wheel were turned, as well as the inside bevel, so that a number of smooth-faced wheels might be applied to it. This edge was beveled about $\frac{6}{16}$ths of an inch. The arms of the wheel were strengthened by a feather on the back. These wheels worked admirably for fifteen years and possibly are doing so yet. I have turned quite a number with a hand tool; slides or engine lathes not being much used then. I see no reason why the grooved frictional gearing should not work well, as I know from experience smooth-faced ones do still.

R. Chappel.

Fonthill, C. W., Feb. 28, 1863.

[Our readers will understand our correspondent's friction gearing when we say that it is the same as a disk valve fitting close into its seat. We should be glad to have further information on the subject from any one who may be in possession of it. The days of toothed gears, for many purposes, are numbered or ought to be. Out with them!—Eds.

The Origin of Some Words.

Some of the most beautiful fancies with which modern poetry is graced are borrowed from the tales of gods and goddesses as depicted in the heathen mythologies. The heavens—vast and trackless as they appear—are full of constellations and of single stars named after ancient heroes and mighty warriors, celebrated in song or in the chase. There are also words in common use which derive their signification from some of the ancient gods or deities whose names they received. "Panic" is one of these words; the definition of it is causeless or unnecessary fear. *Pan* was a rural deity who wandered on the mountains or in the valleys; he was dreaded by such persons as were obliged to pass through the shadowy paths in forests or in glades; the association of such scenes naturally predisposing the mind to alarm and superstitious fears. Any sudden fright, therefore, without visible cause, is to this day called a "panic."

Experiments in Exploding Field Mines by Electricity.

The editor of the Washington *Chronicle* gives the following description of some experiments which he recently witnessed with field mines, which were exploded near the forts on the Virginia side of the Potomac by means of electricity:—

Arriving on the ground, we learned that his Excellency the President was there, accompanied by the Secretary of War, General Heintzelman, General Barnard, General Abercrombie and many other officers of less note. Soon after there was a great explosion immediately in our front; the earth opened and vomited forth stones, shot and shell, vertically, horizontally, and, in fact, in all directions.

Immediately around us were a number of the officers of the signal corps, busily engaged in connecting the wires of a field telegraph to its support, and among them we saw Professor Beardslee, the inventor of the telegraph apparatus now used in our armies. From him we learned that he was exhibiting the application of his new electro-magnetic machine to the explosion of mines, and that he was now ready to fire another.

Quick as the wires could carry the spark there was another explosion even greater than the first, and the air was again filled with earth and smoke, stones and exploding shells; some of the latter falling in uncomfortable proximity to our person.

A third mine was exploded in the same manner. In fact, we should judge from appearances that the ground in front of our forts had been extensively mined, and it is only necessary for Professor Beardslee to connect his apparatus with them, pass the word and they will be exploded.

An order was now passed from Colonel Alexander, of the Engineers, who appeared to have charge of the operations, for the crowd to fall back to a greater distance, as a *fougasse* was about to be fired.

Taking up our position close to the President, we watched for the *fougasse*. We heard a heavy explosion, as if some of the internal fires of the globe were escaping, and the earth belched forth a volcano of smoke, stones and exploding shells even more fearful than before. It rained stones for acres around and in front of it, and must have carried annihilation to any assaulting column in the neighborhood. Immediately after this explosion, there was a rush of the soldiers to see the *fougasse*, but a heap of ruins only showed where it had been placed.

About Tools.

We find it very convenient and profitable to have a work-bench and a set of tools, consisting of three planes, three saws (one cross cut hand-saw, one slitting saw and one panel saw, for trimming, &c), a bit-stock with a set of bits to fit, five chisels, a square and scratch awl, a drawing knife, one pair of small pincers, a hammer and a nail-box, a drawer in work-bench with partitions to put an assortment of bolts, screws, wrought nails, tacks, files, whetstones, chalk and lime, &c.

The above bench, tools and all, will cost about thirty dollars, and if well taken care of, will last a farmer's lifetime. Now, if he has much ingenuity, can save enough by doing his own repairing at odd spells to pay for the tools in two years, and in some cases in one year. Many times during the year something will break when most needed—a horse-rake, for instance; and while you are going to some mechanic to have it fixed, you could mend it yourself, and save expense, if you only had the tools. You could also make your wagon boxes, hay-racks, sheep and cattle racks, milk-rack, sheep troughs, ladders, board fence and picket fence, farm gates, grape trellis and a thousand and one other things, which, if bought or hired made, would cost three times as much and you would not like them as well; like the lady who cultivated one flower and said she admired it more than all remaining in the garden which the gardener had attended.

[The above sensible advice we copy from the *Rural New Yorker*. We would add that if any of our readers are in want of a chest of tools similar in kind to those recommended, we advise him to address George Parr, Buffalo, N. Y., for a list of prices and sizes of different tool-chests which he makes and sells.—Eds.

The Albany *Standard* announces that it will hereafter be printed on common manilla paper, and sold at one cent per copy.

Improved Car Wheel.

In rounding curves on railroads, great strain and friction is brought to bear upon the side of the track by the flanges of the car wheels; the effect produced is an increased consumption of the tractive force and an injurious abrasion of the wheels themselves. Not unfrequently, by the breaking of a flange at such points, entire trains are thrown from the track and precipitated down embankments or otherwise seriously damaged. These difficulties and dangers are measurably overcome by the car wheel here illustrated. It consists in applying a revolving band or tread to the wheel, which, by slipping on the main part of the same, eases the lateral strain. Fig. 1 shows the loose tread, A, made of wrought iron or any other metal most desirable for the purpose. Fig. 2 is a representation of the wheel with the seat, *a*, for the loose tread turned on it. Fig. 3 is a view of the wheel with the tread in place, and Fig. 4 is the remainder of the wheel, which is inserted in Fig. 3, and there secured immovably by bolts. The apertures, *b*, allow oiling of the ring when necessary; the threestops or projections meet the ring on Fig. 3, and keep it at any distance to which it may be regulated so as to permit more or less lateral play. This invention is clearly explained by the engraving, and its operations will be apparent to all intelligent persons. As the train sweeps around the curve the loose tread recedes or advances, laterally, on the seat, and greatly facilitates the movement; it also prevents that side play and oscillation so disagreeable in the cars, which is caused by the unequal action of the flanges of the wheel against the side of the track. This wheel is the invention of Mr. Geo. C. Beecher, of Livonia Station, N. Y., and was patented Jan. 6, 1863. Further information can be had by addressing the inventor as above.

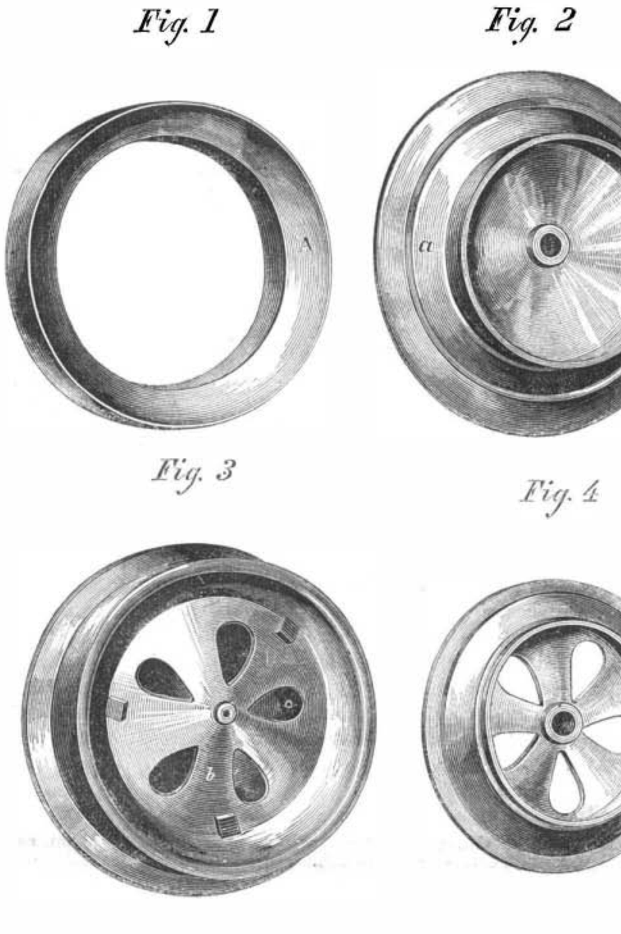
Ahlstrom's Patent Expansion Screw Fastening.

A very excellent and convenient little invention is advertised in another column of the SCIENTIFIC AMERICAN, to which we desire to call the attention of our readers. It is an expansion screw or bolt surrounded by a slotted case having a crotch at the bottom, into which a wedge-shaped nut is drawn by turning the screw itself, this expands the case very forcibly against the sides of any hole in which it may be placed. It is particularly useful in the army and navy or other situations where the conveniences for drilling and tapping holes are not at hand; also for foundrymen, carpenters and marble and stone cutters; in fact, the patent expanding screw fastening will be found available in every mechanical occupation. Our readers who use such things should give it a trial.

Sizes of Steam Cylinders.

Much confusion and popular ignorance exists upon this point, and errors of statement are continually made respecting this or that steamship or boat. There are two vessels building in this city, called the *Dictator*—one is the famous iron-clad battery of that name, the other is a North river steamer; the iron-clad will have two cylinders each 100 inches in diameter by 4 feet stroke of piston; the latter vessel will have one cylinder 83 inches in diameter and 16 feet stroke of piston. The *Dunderberg* will have engines whose cylinders are of similar dimensions to the *Dictator's*. The largest steam cylinder in any steamboat or steam vessel in this country, known to us, is 105 inches; the cylinder of the *Metropolis*—a Sound boat—is of this size, as are also those furnished to the *Golden City* (now building), and the *Constitution* belonging to the Pacific Mail Company; these vessels are the only ones that have cylinders 105 inches in diameter.

THE exportations of fresh meats from the Western States to Europe, by the way of Portland, Maine, (says the Portland *Press*) has grown to be an extensive business. The meats are cut up, partially dried and packed in boxes from three to four feet square; dry salted sufficiently to preserve them on their passage. They are brought by railroad from Ohio, Illinois, &c., and shipped principally by the Canadian line of steamers from Portland. During the month of January last, these steamers took 12,950

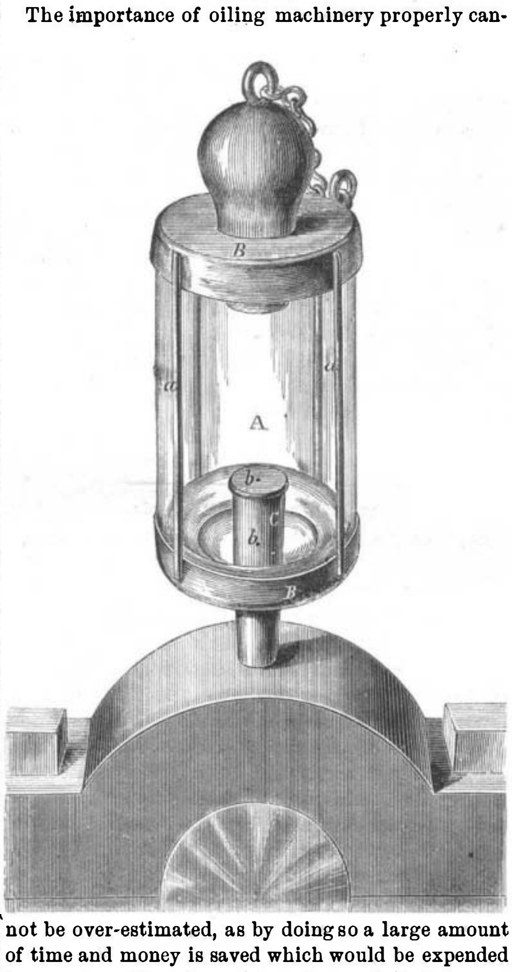


BEECHER'S PATENT CAR WHEEL.

packages of meat, containing 7,371,360 pounds, valued at $870,496 60. Lard, hams, &c., are also exported largely by the same line.

DEWIES' PATENT OIL CUP.

The importance of oiling machinery properly can-



not be over-estimated, as by doing so a large amount of time and money is saved which would be expended in repairs. Very frequently lines of shafting get heated in their bearings in consequence of having been neglected, and when they are in this condition the metals in contact cut and tear each other and destroy that fine surface which is so necessary to easy running machinery. Herewith we illustrate a new and ingenious oil cup constructed on well-known philosophical laws; it effects a steady and constant lubrication of any machinery to which it may be applied. It consists of the glass cylinder, A, confined between two metal caps, B, by the small rods, *a*. The tin tube, C, inserted in the bottom, has two small holes, *b b*, in it through which the oil is fed down to the axle below. The principle upon which this cup works is that of atmospheric pressure and a limited capillary attraction. The rotation of the shaft below is said to cause a partial vacuum in the tube, by which, and the capillary attraction of the small holes, the fluid finds its way down to the shaft. The advantages of such a self-feeding oil cup are very great, and the transparent walls also afford a means of readily observing the quantity of the lubricator supplied to the work. All the oil which passes through the tube must of necessity fall upon the shaft, and as the cup operates only when the machinery is in motion, it will be seen that it is what it purports to be—an automatic oil-feeder. A great saving attends the use of such appliances to machinery, as the expense of a special attendant in the factory is obviated, and by keeping all the wearing surfaces of machinery thoroughly oiled less motive power is required and less expense is entailed on the proprietor for repairs. These cups can be regulated for the amount of work they are required to do, that is, to feed fast or slow; and, we think, they will give satisfaction to those requiring such instruments. This cup was patented on October 21, 1862, by A. C. Dewies, of the kingdom of Prussia, and further information may be had by addressing C. Tollner and Hammacher 209 Bowery, New York.

A Difficult Task well executed.

We recently saw a large gun at the Novelty Iron Works, in process of construction, which was 13 feet 2 inches in length. The gun is cast solid, and is of a peculiar shape and design. The bore, when finished and rifled, one turn in 36 inches, is to be only $2\frac{5}{16}$ths inches; the initial bore, two inches in diameter, was put through the gun from end to end safely, in a common lathe, by Mr. William Wade, a skillful mechanic employed at the Works. The operation was one attended with much anxiety, as it was uncertain whether the texture of the iron was homogeneous throughout. Apprehensions were expressed that fissures or blowholes might exist, which would divert the point of the drill from its center, but, fortunately, the tool went through and came out at the right place. This is a very successful performance, and we doubt if the counterpart of it can be produced. The wrought-iron turret-shaft of the *Monitor*, 6 feet in length, had a $1\frac{3}{4}$-inch hole bored through it, at the same Works, but the other achievement is something more difficult than even the last one quoted.

AMUSING.—A Boston contemporary understands that Martin Farquhar Tupper, the author of "Proverbial Philosophy," wrote a short time ago to a prominent senator of the United States, entreating him to exert his influence with the President to prevent the latter from using the guillotine which he had imported for decapitating the rebels! It expects soon to hear from English sources that the Vicksburgh "cut off" is a machine for cutting off rebel heads, and would not be surprised if a remonstrance against its barbarity was sent to the Commander-in-Chief.

THE quantity of anthracite coal sent to market in 1862, was 7,955,206 tuns, being an increase of 314,948 tuns over the quantity sent in 1861.