Correspondence

The Patent Beer Question.

MESSRS. EDITORS:—The daily and weekly press have of late been much exercised debating opinions relative to patent beer and claims to public favor. It will suffice to say, that some time ago, a number of leading New York lager-beer brewers obtained licenses to brew under the Hammer patent, and as soon as they brought their new beer in competition with the old they encountered all the reverses incident to the introduction of every new invention. Professional jealousy and a stereotyped prejudice against reform helped wonderfully to debar the road of progress, and compelled the licensees to issue their card and the chemical record.

It is not intended to advert to the various views indulged in, but I propose to expose the more important part of the chemical testimony, *i. e.*, the comparative analyses.

We see by the same, that in comparing the old and new method of brewing an immense amount of extract and starch-sugar is wasted by one and saved by the other, while converting malt into wort, the acknowledged base of either beer or spirit.

The figures of the published analytical report demonstrate that wort made in the usual way contains in one gallon of 282 cubic inches and ounces avoirdupois at 60° Fah.:—

Dry malt extract 19·807 ounces, starch sugar 6·005 ounces, while the new, or Hammer wort, at the same temperature, shows the excess of dry malt extract 32·219 ounces, starch-sugar 11·620.

It is not the object of this communication to enlarge upon the pecuniary proceeds resulting from the working of this improvement, but to call attention to another fact passed over altogether by your cotemporaries. Brewing and distilling are two very nearly related vocations; both branches of industry employing nearly the same material under the same circumstances, although different products are rendered, but both trades consume a quantity of grains, which amount to, if correctly reported, a stupendous figure.

Both professions commence their respective operations by mashing the grain preparatory to converting the starch contained in the malted or raw grain into sugar, to be further transformed by fermentation into alcohol and carbonic acid, and here their common path separates. The brewer has now essentially done his work, but not so the distiller. He now sets to work to separate or distil the alcohol from its connection with the wort by converting the former into vapor, and condensing this vapor, which produces what is called alcohol or spirit. When we left the brewer's wort, it contained all the components of beer, requiring but the separation and settling of the yeast, or, in other words, to become clear, in order to be ready for market. It will now be pertinent to examine two brewer's worts prepared under the methods at issue. The old school wort containing (as per analyses) less starch-sugar and a marked surplus of dextrine, which latter ingredient must be looked upon as detracting from the quality and keeping tendency of the beer; the new school wort, on the other hand, showing a very large excess of starch-sugar, the base of alcohol and carbonic acid, with an entire absence of dextrine—and must, under such circumstances, possess a large proportion of the main features of champagne (alcohol and carbonic acid), which impart to the liquid not only that pleasant taste and flavor, but also insure its keeping quality. The distiller's wort, however, prepared after the old recipe, has other disadvantages, for the absence of so large an amount of starch-sugar, imperatively required for the formation of alcohol, necessarily reduces the yield of alcohol; and the presence of so much dextrine, which this imperfect mode of mashing is not qualified to convert into starch-sugar, only serves to enrich the swill or residue. The defects of the old school mashing are thus clearly shown, and sum up as follows:—The old-school distiller, failing to convert all the starch entirely into sugar, loses, consequently, in the quantity of his alcohol, and also, what he retains as dextrine in his swill; but the old-fashioned brewer fares worse still; he is likewise unable to transform all the starch into sugar, and naturally the dextrine remaining thus unconverted, is not connected with the swill, as in the case of the distiller, but is held inseparable in the beer, the result of his labor, where it forms the radicle for the disintegration of the liquid, it impairs the quality and predisposes acidity of the beer, and, as a matter of course, he is a loser both in quality and quantity.

Now, as the purposes of the brewer and distiller are, as far as mashing is concerned, so nearly related, it is but proper to suppose that a certain saving in one branch must be economy for the other; and if, therefore, a given quantity of barley or corn is saved in brewing, the same quantity of superior beer is produced, why cannot the same rule apply to the producer of whisky or alcohol when the object of economizing an enormous amount of grain, useful for other purposes, is at issue?

The patented process also shows the remarkable facility with which starch-sugar is developed, and thereby that much-sought-for base, for alcohol and carbonic acid, gained, but at a reduced expense; and the obvious fact of a perfect exhaustion of the fundamental grain, added to the list of advantages, must still further lessen the cost of production, and infallibly show that whisky, beer, or alcohol can henceforth be furnished at figures widely in contrast with present rates, and causes, at the same time, a simultaneous saving of grains, reserved to be absorbed by the various channels of the market.

It may be safe to state that 100 lbs. of barley will yield about 60 lbs., and 100 lbs. of corn about 70 lbs. of starch, from which the common plan of brewing and distilling does extract but two-thirds, leaving the balance to become a deleterious component of beer in the form of dextrine, or, as in the case of distilling, the remaining one-third forms part and parcel to increase the bulk of the swill. Aside from the benefits of the process, I will now illustrate by figures an approximate estimate of the saving of malt. Take, for instance, a brewery producing per annum 10,000 barrels; here are used under the old rule 2½ bushels of malt and over, for every barrel of lager beer, making a total of 25,000 bushels for the year's supply; the new process, for the same number of barrels, requires about 1¼ bushels of malt per barrel, but let it even be two bushels, consuming in this way 20,000 bushels in all, showing a difference of nearly 5,000 bushels in favor of the agitated reform.

In order not to overtax the reader's patience, it must be stated, in conclusion, that in 1863 there were in the loyal States about 1,800 breweries, all of which produced then no less than seven millions barrels of ale and lager beer, unconscious, perhaps, that they lost at the same time 5,250,000 bushels of malt; and that same figure will, beyond a reasonable doubt, also represent the loss, from the like cause, on the part of our old school distillers. PROGRESS.

Brooklyn, N Y., Feb. 7, 1866.

Of a Large and a Small Pulley.

MESSRS. EDITORS:—In your usually correct journal of the 16th of January, I observed the following question. "Has a large pulley any more purchase than a small one aside from friction?" Your answer was—"A large pulley has more power than a small one in proportion to the difference in diameter." I need not tell you, after you take a second thought, that there is no difference in the power of a large and a small pulley except the additional friction. I should have written you before, had I not waited to have you or some other person correct it. It being such a popular fallacy that I did not like to have it pass without correction, particularly in a journal we Americans are so justly proud of. C. H.

New Haven, Conn., Feb. 10, 1866.

[A pulley has no power at all, strictly speaking, but it is easier to drive a machine with a large pulley than with a small one. It is easier for a horse to draw a carriage with large wheels than with small ones. A wheel is a continuous lever and the longer the arms of the lever, the easier the work is done. —EDS.

Gears for Screw Cutting.

MESSRS. EDITORS:—Having seen in your valuable paper of Feb. 3d, D. Booth's rule for finding the gear for cutting screws, I would ask him how he would find the ratio in case the ratio of increase is not regular. For instance, commencing with 20, 25, 30, 36, 40, 44, 45, 48, 52, 56, 60, 64, 70. There are not many lathes on which the gear increases by any particular ratio. I would like to have Mr. Booth give an explanation. S. V. EASTMAN, Machinist.

Waterloo, C. E, Feb. 4, 1866.

[Rules for cutting screws of any pitch by gears can be found on page 295, Vol. XI.—EDS.

Cold Iron Floating on Molten.

MESSRS. EDITORS:—If into a ladle of molten cast iron a piece of cold cast iron is dropped, the piece of cold iron will float, although its specific gravity is the greatest, as is evident from this, that in cooling iron always shrinks. Please tell us why this heavier cold iron floats in the lighter melted iron.

A SUBSCRIBER.

Watertown, N. Y., Jan. 30, 1866.

[This matter was discussed a good deal in Vol. XII, but no explanation that was offered was entirely satisfactory. Indeed, we have never seen an account of observations of the phenomena that were thorough. Will our correspondent try the experiment of pushing the cold iron under the surface of the molten, and seeing if it will return to the surface?—EDS.

NEW INVENTIONS.

Paper Socks.—The nature of this invention consists in producing a new article of manufacture, viz: socks made of paper, or paper and muslin combined. It is well known that paper is one of the best materials for keeping in or causing the body to retain its natural heat; in other words, it prevents cold air from reaching such parts of the body as may be enveloped in it. The inventor designs his paper socks particularly for use under or over an ordinary pair of socks or stockings, to be worn in cold weather; but it is obvious that they can be made of a kind of paper which will last as long as an ordinary pair would keep clean, and they can be made so cheaply that their cost will not equal the price of washing. These socks are intended to bear the same relation to knitted or woven socks or stockings that paper collars do to linen or muslin collars. J. W. B. Covington, of 37 Park Row, New York City, is the inventor.

Sugar Cleaning Machine.—This improvement relates to that class of machines in which the sugar is cleaned by centrifugal action. The moistened sugar is thrown into a tub which has its sides perforated with fine apertures. Rapid motion being given to the tub, the moisture and dirt are expelled by centrifugal action, and the dry, clean sugar remains in the tub. The present improvement consists in driving the sugar tub from below, thus giving free access thereto. Prior to this invention, the driving shaft passed up through the tub, and cumbersome framework, gearing, etc., was required around and above the machine, which greatly interfered with convenient operation. These improved machines are now in general use. Hartson & Woolsey, New York City, are the patentees.

Water Wheel.—This invention relates to a new and useful improvement in water wheels of that class which are placed on a vertical shaft, and inclosed within a scroll, commonly termed turbine wheels. The object of the invention is to obtain a simple means for varying the capacity of the wheel according to the power required from it or to the supply of water, so that the wheel may operate and give out any amount of power less than its maximum without consuming any more than a proportionate amount of water. It is well known to millwrights that a turbine water wheel, when running under a diminished supply of water, and consequently giving out less than its maximum power, consumes or draws a proportionately greater amount of water than when giving out its full or maximum power. Hence, there is a great loss of water in running a wheel of this class under a variable head or under a diminished supply of water—a difficulty which is fully obviated by this improvement. John Tyler, of West Lebanon, N. H., is the inventor.

Watch.—This invention relates to a watch which shows on its face or dial, besides the hour, minutes, and seconds, also the day of the month, or the date, which appears through a small aperature in the dial, being marked on a disk, which revolves under the dial, and to which an intermittent motion is imparted