



HEAT AND LIGHT FROM FARM CROPS.

Wonderful Possibilities of Denatured Alcohol, Provided for by Congress.

GUY ELLIOTT MITCHELL.

Should even a portion of the benefit results predicted from the passage of the bill removing the tax from denatured alcohol be realized, that measure will ring in a new industrial era not only in the factory but more particularly the farm, and the home. No other work of the Fifty-ninth Congress, not even excepting the railway rate act will compare with this in general beneficence. If half, even a quarter, of what is claimed for it shall come to pass, "Alcohol," says the Philadelphia Record, "might be distilled from potatoes in quantity sufficient to light, heat and supply power to all the Northern States of the Union, and at such a low cost as to supplant kerosene and gasoline. This alcohol would be incapable of use as a beverage. To the dwellers in the country, in particular, such a development would be of instant, universal and in-

heating, cooking and lighting. A bushel of potatoes will produce 0.85 gallons of alcohol. We now raise potatoes almost exclusively for human food, and we plant only those varieties which have the finest flavor for the table, independent of their yield per acre. But there are potatoes yielding many more bushels per acre than these esteemed for food. They are such as are grown for cattle food in parts of the old world where corn is scarce. Secretary of Agriculture Wilson estimates that there would be no difficulty in obtaining 500 gallons of alcohol per acre from such a variety. Potatoes can now be grown here as a commercial crop only within a short distance from market. It does not cost more to haul them far. But as soon as they can be used as a source of heat, light and power, factories will spring up in country neighborhoods where

alcohol is extracted will pay the cost of distillation.

SUGAR BEETS AND MOLASSES.

An acre of sugar beets will produce 224 gallons of alcohol. Our vast irrigation projects in the West are watering lands which will soon produce sugar beets more profitably, perhaps, than any other crops and the molasses from these crops can readily be turned into alcohol. A waste product of the sugar mill, known as "base molasses," would be another available source of our commercial alcohol supply. Millions of gallons of this produced in all the Central and South American countries and the West Indies are now largely burned, fed to animals or destroyed, although a portion is dumped on our shores at almost any price above freight. At New Orleans, Boston and Brooklyn it is being worked up into inferior liquors. The alcohol made from it has a disagreeable odor and taste. But if repulsive matter must be added to it to make it undrinkable and tax-free under the new bill, it will serve as well as any other alcohol thus manufactured for power, heat and light. Already in Cuba such alcohol from this base molasses is being made at 10 cents per gallon. The base molasses itself can be had at New York at 3 cents a gallon. A similar grade of base molasses is turned out as a by-product by our beet sugar factories. Ten factories of Michigan send their produce to a distillery in that state and produce from it about a half million gallons of absolute alcohol. But this by-product of our beet sugar factories generally goes to waste in other states. Yet we sit by and bemoan the decreasing supply and increasing price of coal, the diminishing supply of wood, wonder where we shall turn next for power, heat and light—whether we shall harness the moon with tide motors or the sun with solar engines! Moreover, the production of eastern petroleum is falling off and practically no gasoline is being found in the petroleum of Texas and the West. And yet, according to Dr. Wiley, our farmers can grow any amount of starch and sugar that may be wanted for any purpose in the world and not a pound of it would take one element of fertility from the soil.

CO-OPERATIVE DISTILLERIES.

That the farmers in all corn-growing sections of the country should establish co-operative distilleries for the sole purpose of producing this denatured industrial alcohol, is the

ALCOHOL FROM CORN AND STALKS.

An acre of corn—fifty bushels—will furnish 130 gallons of absolute alcohol; a bushel of corn, two and four-fifths gallons. An acre of potatoes thus



OLD-FASHIONED SOUTHERN SUGAR MILL.

produces much more alcohol than an acre of corn, when only the grain of the latter is taken into consideration. But corn stalks if harvested before they dry out contain large quantities of sugar and starch, enough to produce 100 gallons of commercial alcohol per acre, according to the estimate of Secretary Wilson. In 100,000,000 acres of Indian corn the making of ten billion gallons of this alcohol therefore go largely to waste annually. Secretary Wilson predicts that the time is coming when we will utilize this immense source of energy. According to Dr. Wiley the fermentable material in the

proposition of Nahum Bachelder, master of the National Grange, is pressing the passage in the interest of the 800,000 farmers of his organization. These co-operative distilleries would be under close government supervision, and the alcohol would be rendered unfit for beverage purposes before leaving the distillery warehouse. In this way the cost to the farmers of this material for lighting, heating, cooking and motor fuel purposes could be kept at the lowest point.

In Great Britain alcohol made undrinkable by the addition of 5 per cent of wood alcohol and a much smaller proportion of mineral naphtha is now sold freely without tax. Since 1887 Germany also had untaxed alcohol for industrial purposes. France, Italy, Russia, land, Holland, Belgium, Italy, Russia, Sweden, Norway, Austria-Hungary, Portugal and six Latin-American republics exact no tax on this "denatured" alcohol, already regarded as one of the necessities of agriculture, manufacture and general industry. In these "free-alcohol countries" there are being used many varieties of alcohol engines, alcohol automobiles, alcohol motor boats, alcohol farm motors, alcohol lamps and alcohol stoves.

ALREADY SUCCEEDS IN EUROPE.

Germany has far surpassed in all of these inventions, which were largely mothered by necessity, for the fatherland has no natural gas or petroleum. But its broad sandy plains produce cheap and abundant crops of potatoes, from which every farmer manufactures a vast quantity of raw alcohol. Inventors and scientists have been busy with improvements in farm distilleries, motors, lamps, cookers and heating apparatus. Their "silent motors" are being turned out in all forms—upright and horizontal, stationary, portable and locomotive. Alcohol locomotives pull trains of a dozen cars on large farms, sugar plantations and engineering works. The army has had built ten horse-power alcohol "engineers' wagons," each with a speed of ten miles an hour, carrying tools and apparatus for a regiment of engineers. The cost of converting this denatured (or undrinkable) alcohol back into its original condition would be much more than for making pure alcohol anew, according to Dr. Wiley. He thinks the best method of making it undrinkable would be the addition of ten per cent of wood alcohol and one per cent of "pyridine." According to the bill as it passed, the denaturing ingredients are left to the discretion of the internal revenue tax.

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SOME NEW PARISIAN LINGERIE.

Colors in Blouses Very Especially the BERTHE.

In the new Parisian lingerie, the fashion is to have sets of chemises, drawers and short petticoats of the same material and type, and all trimmed in the same manner. Nainsook and very fine batiste are the materials usually employed for their construction, the mode of silk underwear being for the time abandoned. There are two new fabrics called silk nainsook and silk chiffon, both cotton, but of very fine weave, and which do not lose their glossy appearance in washing. These materials have much the appearance of silk and in garments made of them lace is profusely used. The lace comprises much of the upper portion of the chemise and the sleeves which are of bell shape reaching almost to the elbow. These are open



A NEW UNDERGARMENT.

nearly to the shoulder over the forearm, where they are loosely tied with a succession of ribbon bows. In lingerie garments the square neck is preferred to the round this year, and this is always finished with a band of lace or embroidery.

The empire form is, of course, very fashionable for chemises, but while it is a pretty cut, it needs to be made of very fine material else its straight form will lie in folds beneath the corset. Most chemises now-a-days are shaped in under the arms so as to do away with this extra width at the waist-line. A pretty finishing to take the place of sleeves and shoulder parts on a garment to be worn with décolleté dress, consists of and may be untied and slipped beneath the bodice when worn with the evening gown. The Japanese nightgown of quite loose cut is a decided novelty. This has rows of little tufts descending from the shoulder and extending half way down the figure. A double band of insertion starts at the foot of the gown, passes by the side of the tucks over the right shoulder and around the neck at the back, meeting in the centre of the front at the waistline. The sleeves are loose and flowing as befits a garment of this nature. Few nightdresses have collars, most of them being finished with straight bands of embroidery or lace.

CHARMING DRESSING SACKS.

Some very jaunty little dressing sacks of silky batiste or nainsook are being constructed. These are entirely accordeon pleated, except for a portion of the sleeve. Lace and insertion surround the throat, and for those of Empire cut, a band of the same marks the high waistline in back and in front rises over the bust to be fastened with ribbons. Some of these lingerie tea jackets have broad and elaborate collars which reach over the shoulders.

Another new comer is the blouse waistcoat of embroidered linen, batiste or mousseline de soie. This is made without sleeves and drawn in about the waist with a tape to adjust the fullness in front. These are designed to be worn with lingerie suits of which a long or short jacket forms a part. Lingerie petticoats are of increasing daintiness. They are for the most part elaborately trimmed, the top portion being of sheath-like cut and fitting without a bit of fullness. They are completed with broad flounces of tucks, embroidery and lace. Some of these flounces show several fringes of lace or embroidery, while others are elaborate with hand-embroidered designs.

Viols.

The roses I sent were red,
My rival sent her white;
My heart is torn with doubt and fear—
Which will she wear to-night?

I hear her step upon the stair,
Ah, Fortune, now disclose!
My lady comes; stand still, my heart!
Whose viols are those?

One More on Mary.

From Technical World.
"Mary had a little lamb,
Just thirty years ago;
The chops we had for lunch to-day
Were from that lamb, we know."
Q. E. D.—How old is Mary?

The Pope's Wardrobe.

A large number of women are employed at the Vatican solely in keeping the Pope's wardrobe in perfect condition. No spot or stain may disfigure his garments, and, as he always appears in white, even a few hours' wear deprives the robes of their freshness. Women are permitted to serve the Pontiff in this one respect only as male attendants are not considered suitable for the work. Only the most delicate materials are used—moire silk in summer, and a specially woven fine cloth in winter.

THE MESSAGE.

"Listen," said Raleigh, and suddenly seized my hand.
"That is nothing but the sock in the next room, is it?"
He did not seem to be in a hurry, but kept on rattling noise, a perspiration of his forehead, and a far away look in his eyes.

"It is nothing at all," I repeated. "I do not understand what is the matter with you. Tell me."
"Oh, never mind," he answered, "but surely you heard it as well as I. Didn't you?"

"Well, then, the time has come. For hours, days, years, I have expected it, have oftentimes longed for, and still now, when it has come, it seems hard to leave this world so suddenly."
"Nonsense," I said, "what has the alarm clock to do with your death?"
He looked at me with the same wonderful expression in his eyes, and said:

"Well, I will tell you what I have never told any one before."
"You remember that Lora died three years ago?"
"She died at exactly twenty-three minutes of five in the afternoon. Look at your watch and see what time it is now."

I looked at my watch.
"Just twenty minutes of five."
"Yes, and three minutes ago that alarm went off, just at the hour and minute of her death."

I looked at Raleigh in astonishment.
"Well, even if that is so, I do not see what Lora's death has to do with you."

"With me! Oh! but you don't know even my dearest friend. How should you know that Lora was my wife. Nobody knew it but ourselves."

"Lora was your wife?"
"Yes, my wife," he replied, with tears in his eyes. "You know how her father hated me and why. But she loved me as I loved her, and so we married secretly a few weeks before she died. I was not at her deathbed and would not have known had not the manservant broken in that very clock we just heard with just the same peculiar noise. At the moment it happened a feeling of deadly terror overpowered me. I rushed to her home, but they would not let me in. I cried that she was my wife, but they slammed the door in my face, and I swooned away."

"When I came to my senses again I was here. How I got to my room I do not know, but I do know that she was with me and at my side, pale as a ghost."

"Lora," I cried. She turned to me and said: "Wait for me, dear, the clock will call you."

"Lora," I cried again. Another woman stood at my side. "He is delirious," she said. "We must renew the icebag."

"Now you have heard it just as I did. The clock has called and I must go."

"But, Raleigh—" I began.
He interrupted me.

"Do not say anything," he whispered. "I know it and I am ready. I have been waiting so long—oh, so long. Good bye!"

He reached eagerly forward, as if to embrace some one, but suddenly fell back into my arms, his face transfused into the most beautiful expression I have ever seen. "Do you see her? There at the door! I am coming, I am coming, my darling."
A tremor went through him and he was dead.—The Oklahoman.

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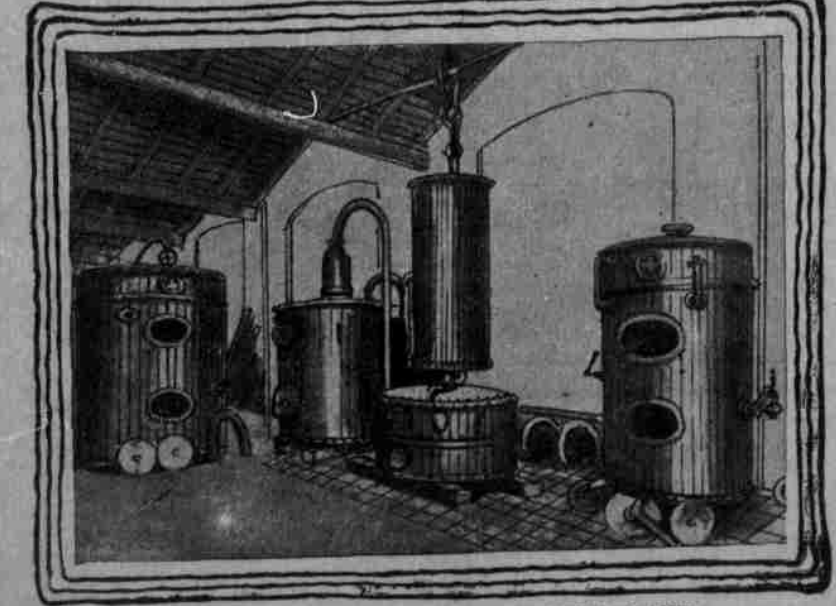
SUGAR BEETS WILL PRODUCE ALCOHOL FOR THE WEST.

calculable benefit; but to every man, no matter where he lives, it would be of some importance." Says the Louisville Courier Journal, after quoting the Philadelphia Record's tribute to the coming great and almost universal blessing: "And potatoes are only one of hundreds of things from which this useful product would be distilled if the tax were removed. Such a step would create in this country a practically new and vastly beneficial industry, whose benefits would be shared by the whole people as consumers, and by hundreds of thousands of them as producers." There is scarcely a nameable limit to the production of potatoes.

WOULD USE UP WASTE PRODUCTS.

Potatoes, beets, corn—the stalks as well as the grain—and the waste products of our molasses factories may run our engines, cook our meals, heat and light our homes. The present tax of \$1.10 per gallon on commercial alcohol renders its use for power, fuel and light absolutely out of the question, although for these purposes it can be manufactured at less than 10 cents a gallon. At this rate it can supplant both gasoline and kerosene, than which it is also safer and much cleaner. The only opponents of the bill were the wood alcohol and Standard Oil interests, which would be the losers. Farmers, especially, insisted upon its passage.

The white potato can readily heat, light and furnish power for our Northern states; the sweet potato, the yam and the waste from the molasses factory can do the same for our Southern states, while in the great West the sugar beet and Indian corn can turn the wheels of the factory, farm and conveyance and banish from the home the chill of winter or the blackness of night. Such is the statement of Prof. H. W. Wiley, Chief of the government's bureau of chemistry. Sugar and starch, when fermenting, yield about half their weight in a soluble alcohol. About one-fifth the weight of potatoes, nearly three-quarters the weight of corn and al-



A GERMAN CO-OPERATIVE DISTILLING PLANT.

most one-sixth that of the sugar beet are these fermentable sugars and starches.

POTATO A GOOD ALCOHOL MAKER.

The potato will be our chief source of this undrinkable commercial alcohol. A good yield of potatoes—300 bushels—will produce 255 gallons of such fuel for running automobiles, farm motors and other engines; for

stalks could be removed by the presses now used to extract the juice of sugar cane. And speaking of commercial alcohol from corn, it might be of interest to add a statement from Dr. Wiley, that twenty times more power can be obtained by burning the alcohol in corn than by burning the corn itself—as has been done in the West in times of coal famine. It is also estimated that the value of the by-products of corn after the industrial

The cost of converting this denatured