UNITED STATES PATENT OFFICE.

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RECTIFICATION OF ALCOHOL.

SPECIFICATION forming part of Letters Patent No. 408,583, dated August 6, 1889.

Application filed December 10, 1888. Serial No. 293,171. (No specimens.) Patented in France August 9, 1888, No. 192,321, and in Belgium August 10, 1888, No. 82,861.

To all whom it may concern:

Be it known that I, ANDRÉ THÉODORE CHRISTOPH, civil engineer, a citizen of the Republic of France, residing at 5 Rue Meyerbeer, Paris, in the Republic of France, have invented certain new and useful Improvements in the Rectification of Alcohol, (for which I have received Letters Patent in France, No. 192,321, dated August 9, 1888, and Belgium, No. 82,861, dated August 10, 1888,) of which improvements the following is a description.

In the rectification of alcohol it is usual to take the impure spirit at a strength of about thirty to sixty per cent., and by rectification to separate it into three successive products. The middle product (or that which comes after about thirty per cent. of the whole has been distilled over) is good alcohol of a strength of about ninety per cent.

I obtain by my improvements both a better middle product and a larger yield thereof by submitting the impure alcohol—preferably when in a cold state—to the preliminary treatment hereinafter set forth before it is passed into the rectifier. In this preliminary treatment I make use of sodium alloyed with tin. I also treat the impure alcohol with hypochlorite of lime, (bleaching-powder;) but I believe that I am the first to use sodium amalgamated or alloyed with other metals, as with mercury or lead, when used in connection with hypochlorite of lime (bleaching-powder) or other hypochlorite; and, so far as part of my invention is concerned, I do not limit myself to the use of sodium alloyed with tin or sodium-tin amalgam, or to the use of bleaching-powder. The hypochlorite may be used either previously to or simultaneously with the action on the impure alcohol of the alloy or amalgam of sodium.

Potassium and other alkaline metals may be substituted for sodium, but probably not with commercial advantage.

By preference I proceed as follows in carrying out my improved process: The impure spirit is placed in a large vat containing an agitator, both of ordinary well-known construction. The strength of this spirit is reduced, if necessary, to about forty per cent. Hypochlorite of lime (bleaching-powder) is then mixed with this diluted spirit in about the proportion of a gram per liter of the diluted spirit, well stirred, and allowed to stand for some minutes. Sodium-tin alloy or amalgam is then added in such proportions as to have present fifteen to twenty grams of sodium for each one hundred liters of liquid. I use more or less, according to the degree of purity of the crude spirit. The alloy or the amalgam is placed in the vat—preferably in small pieces, in order to offer a large working-surface.

If using the amalgam, I place it in an earthenware tray on the bottom of the vat, so that the mercury may be retained.

The agitator should be kept in motion for half an hour or more. After some time the spirit is transferred from the vat to the rectifier. A very convenient arrangement is to submit the impure alcohol to the cold treatment over night and to transfer it to the rectifier in the morning.

The rectification is conducted in the usual manner, except that it will be found on testing that the good alcohol comes over at an earlier stage than heretofore, and that the yield is better in quality and larger in quantity than heretofore. As usual, the spirit which first and last comes over, and which is more or less impure, is collected separately and is again treated as before in the vat.

In the preparation of the sodium alloy or amalgam I use such a proportion of sodium that the product may decompose water tolerably freely, but without violence and without the aid of heat.

Although it is industrially advantageous to submit the impure alcohol to treatment in a cold state before the commencement of the rectification, nevertheless the treatment may take place in the rectifier itself.

I do not claim herein the use of sodium amalgam alone in the rectification of alcohol, as that is old; but I believe myself to be the first to use such amalgam in combination with bleaching-powder in this process, which use I have found advantageous. I also believe myself to be the first to use sodium-tin alloy in such process, which alloy possesses

several advantages, such as being free from the poisonous effects of mercury, being easily made, readily pulverizable, and conveniently kept without change for an indefinite time.

Having now particularly described my said invention and in what manner it is to be performed, what I claim is—

1. The process herein described, which consists in mixing the impure spirit of alcohol with sodium-tin alloy and then rectifying it.

2. The process herein described, which consists in mixing the impure spirit of alcohol with an alloy or amalgam of sodium and a hypochlorite—such as bleaching-powder—and then rectifying it.

3. The hereinbefore-described process for the rectification of alcohol, which consists in mixing the impure spirit, containing about forty per cent. of absolute alcohol, with sodium-tin alloy, in the manner specified, in the proportion of about fifteen or twenty grams of sodium for each one hundred liters of liquid, and distilling the mixture, as set forth.

4. The hereinbefore-described process for the rectification of alcohol, which consists in successively diluting the impure spirit to about forty per cent. of absolute alcohol, adding hypochlorite of lime (bleaching-powder) in about the proportion of one gram per liter of the diluted spirit, stirring the mixture, and then adding sodium-tin alloy in about the proportions specified, and then distilling the mixture, as set forth.

5. The hereinbefore-described process for the rectification of alcohol, which consists in mixing hypochlorites with cold diluted impure spirit, adding sodium-tin alloy, agitating the mixture, allowing it to stand, and then distilling it, all substantially as set forth.

6. The hereinbefore-described process for the rectification of alcohol, which consists in successively diluting the impure spirit to about forty per cent. of absolute alcohol, mixing it with hypochlorite of lime (bleaching-powder) in about the proportion of one gram per liter of the diluted spirit, stirring the mixture, allowing it to stand, then adding an alloy of alkaline metal in such proportion as to have present about fifteen to twenty grams of alkaline metal for each one hundred liters of liquid, then agitating and distilling, substantially as specified.

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Witnesses:
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