

# United States Patent Office.

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## IMPROVEMENT IN BONE-COAL AND OTHER FILTERS.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern :*

Be it known that I, HENRY TORSTRICK, of New York, in the county and State of New York, have invented a certain new and useful Improvement in Bone-Coal and other Filters; and I do hereby declare that the following is a full, clear, and exact description of the same, and the manner in which it may be applied.

It has hitherto been necessary to carefully sift the bone-coal prepared for filters, such as are commonly used by sugar-refiners, for the purpose of removing the fine dust, and the waste from this cause, occasioned by the repeated and necessary handlings in placing it in the filters and removing it from them, and in reburning and sifting, has been a very important element in the cost of the production of refined sugar. Although the dust presents a greater surface, over which the sirup should pass in its flow through the filter, than an equal weight of coal in larger bits or fragments, it has been found impracticable to use it, for the reason, that, when it becomes fully saturated, it forms a pasty mass, through which the sirup is unable to run with the rapidity requisite for its practical use; and when it may be attempted to hasten or assist the operation by means of pressure on the surface of the liquor in the filter, or by suction beneath the filtering-material, an opening or channel is forced through the mass, by which the liquor escapes, without deriving any benefit from the main body of the coal. In a similar manner, when the bone has not been sifted, to remove the dust, the latter fills up the pores or interstices between the larger pieces, and speedily clogs it to a degree that renders the filter practically useless long before the decolorizing and purifying-power of the bone is exhausted.

The object of my invention is to utilize, for filtering-purposes, the bone-dust that has been of but little value, and it is accomplished by mixing the bone-dust with fine anthracite coal, or other similar substance or material that is insoluble in the liquid to be filtered, and remains unaffected under the circumstances of heating, washing, and steaming, to which it may be subjected, except when thereby brought into a condition more favorable for the intended purpose, and which will hold the particles of the bone-dust apart, and prevent their forming, either by themselves or with the dividing-agent, a paste that is comparatively impervious to the solution or liquid it is desired to filter.

To enable others skilled in the arts to which it appertains, to make and use my invention, I will proceed to describe in detail the manner of carrying it into effect.

I mix the bone-black as thoroughly and intimately as may be possible, with about the same measure of fine anthracite coal, and, after heating the mixture, place it in a filter, of any of the ordinary forms, provided at the bottom with a lining of flannel or felt, to prevent the washing out of the dust.

The same end may be attained by the employment, as a divisor or separating-agent, instead of fine anthracite coal, of any other material with a similar nature,

that is insoluble, and not acted upon in the liquid to be filtered, and under the circumstances incident to filtration and renovation of the bone by steaming and heating, or by fermentation with acids, or other treatment to which it may be subjected while in use, or for subsequent cleansing.

By the use of a mixing-agent that fulfils these requirements, and the particles of which are of a hard, sharp, and glazed character, the bone-dust is so separated that it can no longer form a pasty mass that is comparatively impervious to the fluid to be filtered, and all portions of its surface are thus brought into efficient action in the filter.

The same principle may be applied to burnt blood, or other decolorizing-agent or filtering-medium, in a finely-divided state, that may be used instead of bone-coal, and which would otherwise pack itself together, so that the fluid to be filtered would fail to pass readily through it. The liquor and the filter should be kept heated, to promote its efficiency, and it is believed that the mixture of fine anthracite, as described, retains the heat better than bone-coal alone.

I prefer the dust of anthracite as a dividing-agent, on account of its cheapness, occasioned by the large quantities necessarily produced in the mining and working of coal, for which there has hitherto been no profitable use, and, although its power of decolorizing and separating impurities, as a filter, may not be sufficient to warrant its separate use for the purpose, its virtue in this respect is an addition to its intended function, of enabling the profitable use of the fine dust of burnt bone.

By the admixture of a finely-divided glazed material, as described, the bone-dust may be more thoroughly cleaned by washing and steaming, as a preliminary to its restoration by fermentation, or acids or other agents.

The reburning of bone-black dust, also, that has been hitherto impracticable, for the reason that it aggregates into a mass when wet with sirup, and sticks together in irregular lumps, and adheres to the calcinating-vessels, may be accomplished by the addition of a dividing-agent, of the character hereinbefore described, by which means the carbonization may be more perfectly regulated and rendered more uniform, and both the over and the under-calcination, that are so detrimental to the efficacy of its action, may be easily avoided.

The proportionate quantity of anthracite or other divisor may be adjusted so that the percolation will be slow, owing to the preponderance of the bone-dust, or with a larger quantity of the divisor, the filtration will be more rapid, and a thicker stratum of the mixed material will be required to retain the liquid in contact with the bone a sufficient time to become thoroughly decolorized.

By the method that has been herein described more particularly in connection with bone-black, and its employment by sugar-refiners, but which is applicable to other material and for other filtering-purposes, the fine



dust of bone-black, that would otherwise be useless for a filter, is rendered of value, and advantage may be taken of the larger proportion of surface afforded by the same weight of dust, compared with bits of greater size, and a proportionably less amount of bone may be used, and, finally, the same method of separating the molecules of dust admits of their complete and uniform renovation or restoration, by washing, reburning, or other means that requires access to every particle of the fine dust.

I claim, as my invention—

The use of a dividing-agent substantially as described, in connection with the filtering-material, for the purpose of filtration.

Also, the use of a dividing-agent in reburning or otherwise restoring bone-dust.

HENRY TORSTRICK.

Witnesses:

THOMAS DAY,  
WM. KEMBLE HALL.