

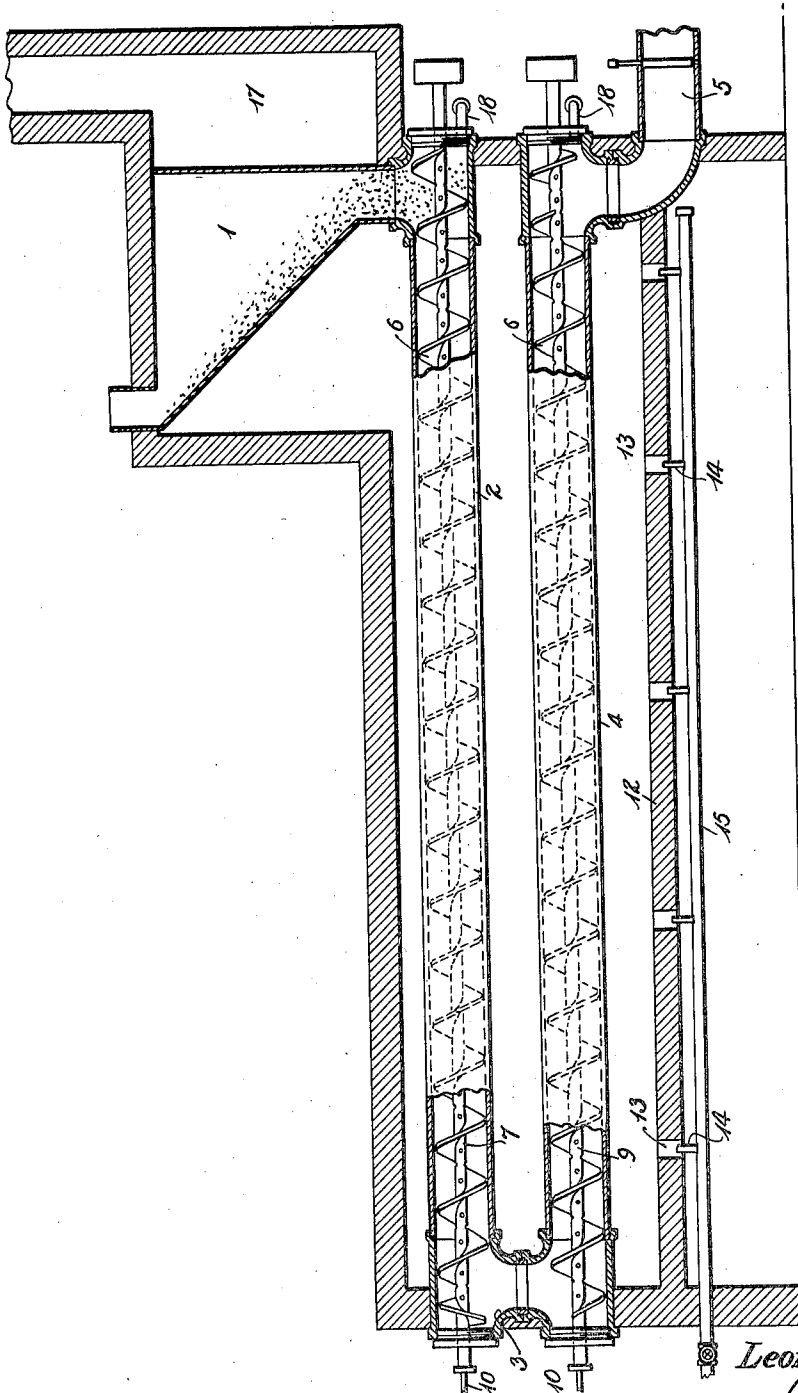
Jan. 4, 1927.

1,613,299

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PROCESS OF REVIVIFYING FULLER'S EARTH

Filed April 10, 1925



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Patented Jan. 4, 1927.

1,613,299

UNITED STATES PATENT OFFICE.

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PROCESS OF REVIVIFYING FULLER'S EARTH.

Application filed April 10, 1925. Serial No. 22,134.

The invention relates to improvements in a process for revivifying fuller's earth.

The invention aims more particularly to provide such a process for the treatment of fuller's earth used in the decolorizing, refining or treatment of hydrocarbon oils.

In revivifying fuller's earth it has in the past been the practice to introduce a body of this earth to a retort and after initiating combustion in a bed of this earth controlling such combustion by introducing air and an inert gas in a definite proportion.

My invention more particularly relates to a revivifying process in which the fuller's earth undergoing treatment is maintained in a constant state of agitation while being subjected to a temperature sufficient to revivify the same without causing a fusing of the earth particles.

In the accompanying drawings I have shown an apparatus capable of carrying out this process in which Figure 1 represents a diagrammatic view with parts in section.

In carrying out this process the spent and washed fuller's earth that is to be revivified is introduced to the hopper 1 and fed from this hopper into a pipe or conduit 2 disposed in a horizontal plane and having an elbow 3 at one end connecting said pipe with a second parallel pipe 4 provided with a discharge 5 controlled by a valve of any suitable type.

Disposed within each pipe or conduit 2 and 4 is an agitator 6 operated by a hollow shaft perforated at necessary intervals, as indicated by the reference character 10, to admit sufficient air to cause combustion of foreign matter in the earth, for keeping the fuller's earth in a constant state of agitation during its passage through this pipe. A similar agitator is, of course, also provided in the pipe 4 driven by a shaft 9.

The revivifying tubes 2 and 4 are supported in a furnace retort 11 as clearly shown in the drawings. This retort has a lower hearth or partition walls 12 having a series of apertures 13 therein receiving the gas burners 14 leading from the gas feeding pipe 15. Such burners provide the means for heating the earth in the retort. The products of combustion pass out through the flue 17 to any suitable point of discharge. Gases and vapors discharge from the pipes or conduits 2 and 4 through the outlets 18, such gases being recovered for subsequent

use, if desirable, or if they are of no use the gases may be discharged to the atmosphere.

In carrying out this process the spent and washed earth which, of course, must be revivified if it is further used in connection with petroleum oils in manners well known to the art, is introduced to the hopper A and feeds into the upper conduit B. The shaft is rotated, causing this material to be constantly agitated while traveling through its tube and into the lower tube 4. In this tube the shaft 9 also causes a constant movement and agitation of the material. The material during this treatment may be heated to any desirable temperature such as 1100° or 1400° F. This heat is produced by the burners 14, and the heat from the combustible materials being burned from the fuller's earth. It will also be apparent that during this treatment of the material air is being constantly admitted to the tubes 2 and 4 in which the fuller's earth is undergoing agitation, causing the carbon to be burned out of this earth without permitting a fusion thereof. The agitation of the earth while at a temperature of say from 1100° to 1400° F. destroys the tendency of the earth to fuse when the air is introduced thereto, permitting the earth to be thoroughly revivified in a minimum amount of time, and as before stated, permitting high temperatures to be used to completely revivify the earth without causing the said earth to sinter or fuse. It will be understood that the earth is in a comminuted form and that the particles are constantly in agitation when being subjected to their heat treatment in the presence of the air which serves naturally to burn out combustible materials contained in the earth. The time of treatment of the material may vary from 10 to 30 minutes depending upon the temperature of the earth entering the chamber and the temperature maintained therein.

In operation other means other than the mechanical agitator may be employed for keeping the earth in a constant state of agitation, and I may, for instance, use a strong air blast or any medium by which the earth is kept in motion while undergoing treatment.

Having thus described my invention what I claim is:

1. A process for revivifying spent fuller's earth, consisting in passing the earth

through a passageway in indirect heat conductive relation with heating gases applied to the passageway, in introducing air to the material in the passageway at longitudinally spaced intervals while it is being heated in sufficient quantity to burn combustible carbonaceous material contained therein, and in maintaining the earth in a state of agitation during such treatment.

10 2. A continuous process for revivifying spent fuller's earth, consisting in passing the earth through an elongated passageway in indirect heat-conducting relation with heating gas applied to the passageway, in introducing air to the earth at longitudinal spaced intervals in such passageway, and in raising the temperature of the earth sufficiently high to cause combustion of the carbon contained therein.

20 3. A process for revivifying spent solid absorbent material consisting in introducing such material to a closed chamber, in heating the material in said chamber by an indirect heat treatment, in introducing air to the material undergoing treatment in said chamber at longitudinally spaced intervals, and in discharging volatiles removed from said material.

4. A process for revivifying spent solid absorbent material consisting in introducing such material to a closed chamber, in heating the material in said chamber by an indirect heat treatment, in introducing air to the material undergoing treatment in said chamber at longitudinally spaced intervals, and in agitating the material during its treatment.

5. A process for revivifying spent solid absorbent material, consisting in introducing such material to a closed chamber, in heating the material in said chamber by an indirect heat treatment, and in introducing air to the material undergoing treatment in said chamber at spaced intervals throughout its length and in discharging volatiles removed from such material.

6. A process for revivifying spent solid absorbent material, consisting in introducing such material to a chamber, in heating the material in said chamber, and in introducing air to the material undergoing treatment at spaced intervals throughout the length of the chamber, and in discharging volatiles removed from said material.

In testimony whereof I affix my signature.

LEON A. TARBOX.