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W. MEISCHKE-SMITH

PROCESS OF DISTILLING BITUMINOUS MATTER

Filed Apr. 26, 1920

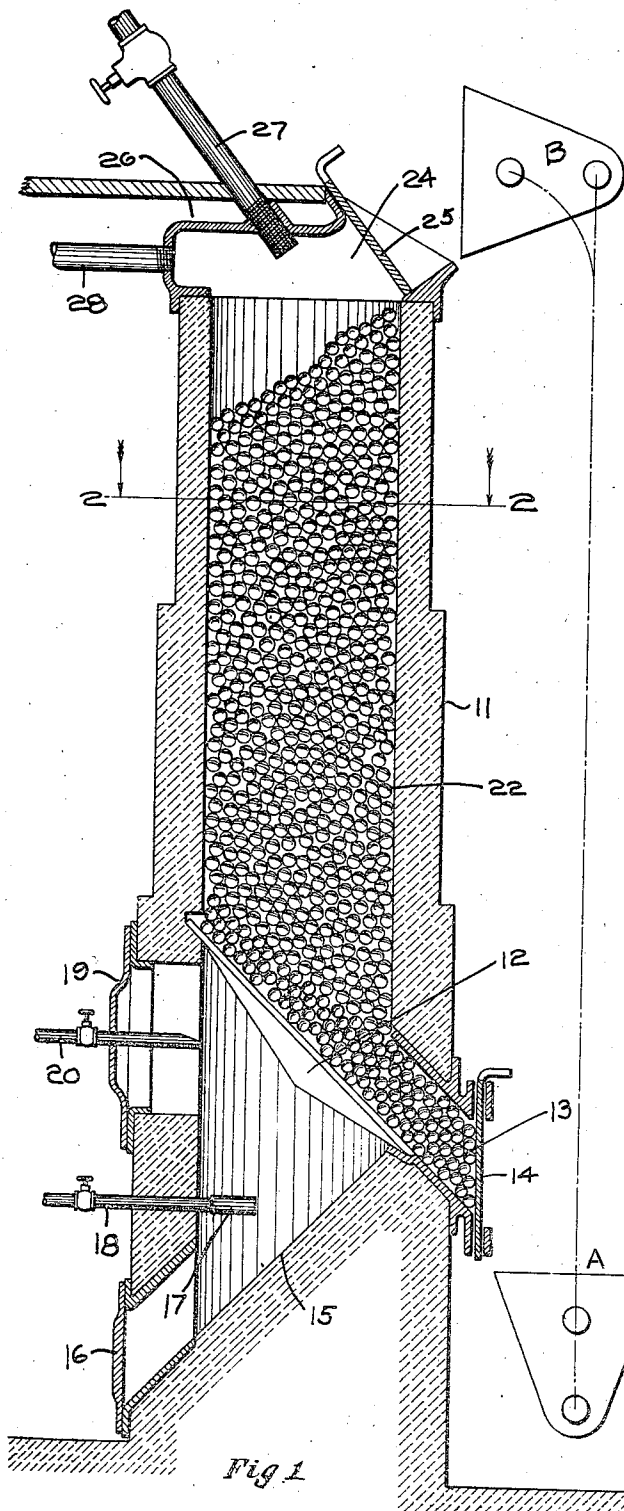


Fig 1

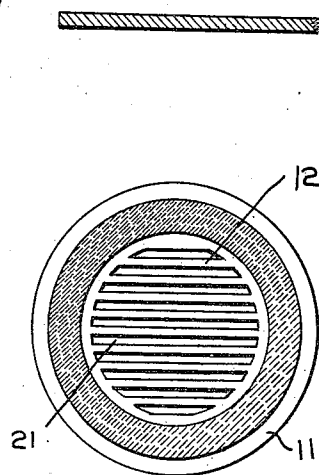


Fig 2

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WILLIAM MEISCHKE-SMITH, OF BOLDRE HILL, BOLDRE HANTS, ENGLAND.

PROCESS OF DISTILLING BITUMINOUS MATTER.

Application filed April 26, 1920. Serial No. 376,944.

To all whom it may concern:

Be it known that I, WILLIAM MEISCHKE-SMITH, a subject of the King of Great Britain, residing at Boldre Hill, Boldre Hants, England, have invented a new and useful Process of Distilling Bituminous Matter, of which the following is a specification.

My invention relates to the art of distilling, and more particularly to the art of distilling heavy crude oils, asphalts, refinery residuums and other bituminous matter. There are found in many parts of the world, and more particularly in Mexico, very heavy oils which are of very little commercial value due to the fact that they are semi-solid at ordinary temperatures and so viscous that they cannot be pumped through an ordinary pipe line. It is also very difficult to handle them in tank cars or steamers due to the fact that they are solid at ordinary temperatures and it is necessary to heat them to cause them to flow. These crude oils are also of little value in that it is difficult to utilize them as fuel without preliminary heating and other uses to which they may be applied are rather limited. There is also produced a large amount of heavy residuum and asphaltum in the ordinary process of refining oils and these heavy residuums and asphaltums are also of very little commercial value due to the limited market therefor.

It is an object of my invention to provide means by which this heavy bituminous matter can be distilled to produce lighter oils having a much higher commercial value. The value of this heavy bituminous matter is so low that it is profitable to use methods in which a portion of it is destroyed as the difference in value of the remainder more than compensates for this loss.

Referring to the drawing which is for illustrative purposes only.

Fig. 1 is a sectional elevation of a diagrammatic form of apparatus by which the process can be carried on.

Fig. 2 is a plan view on line 2-2, Fig. 1, the contents of the stack being removed for the purpose of better showing the internal construction.

In the form of the invention illustrated in the drawings, a vertical stack 11 is provided, this stack having included grate bars 12, the lower ends of which coincide with the lower portion of an outlet opening 13

which is provided with a sliding door 14. The bottom of the furnace 15 is inclined to an ash door 16 and an oil or gas burner 17 fed through a pipe 18 projects into the space below the grate bars 12, access to this space being had by means of a door 19 through which a steam pipe 20 projects.

The openings 21 between the grate bars 12 are of such a size as to readily retain a charge of cast iron balls 22 which nearly fill the stack 11, but which may be removed through the opening 13. The skip hoist 23 is provided which is normally in the position "A" but which can be raised into the position "B" for the purpose of dumping the balls through an opening 24 normally closed by a door 25 in a top structure 26 on the top of the stack 11. An oil pipe 27 projects into the space at the top of the stack and a vapor outlet pipe 28 is so placed as to carry gases away therefrom.

The method of operation is as follows:—

The stack is charged with the balls 22 which are then heated by means of the gas burner 17, the hot gases therefrom passing upwardly between the balls and being carried away through the opening 24, the door 25 being open. As soon as the balls in the lower portion of the stack 11 begin to be slightly red the door 25 is closed and oil is admitted through the pipe 26, this oil falling upon the balls and percolating downwardly therebetween. The balls being hot, a portion of the oil is distilled and is carried off through the vapor outlet pipe 28. The remainder of the oil becomes coked upon the balls. The whole mass of balls is allowed to settle as the door 14 is opened and a portion of the balls is allowed to discharge through the opening 13 into the skip 23. This door is held open until a skip load of balls is discharged into the skip 23 when the door 14 is closed and the balls are elevated by means of the skip 23, being dumped into the top of the stack through the opening 24, the door 25 being opened for this purpose.

The oil is allowed to flow continuously through the pipe 26 and the balls are removed from time to time through the opening 13 and fed into the top of the stack by means of the skip hoist 23. The whole mass of balls is therefore intermittently in motion, settling slowly through the stack until the carbon coked balls are sufficiently heated by the hot flames from the burner 17 to cause the carbon to become ignited, this car-

bon furnishing sufficient heat so that the burner 17 may thereafter be shut off.

The process therefore is a continuous one, the balls slowly settling in the stack and carrying with them the carbon which is formed on the surface thereof. As this carbon reaches the combustion zone, which is just above the grate 12, the carbon becomes ignited and furnishes hot gases which pass upwardly between the balls 22, acting upon the oil to distill off the volatile portions, leaving a coating of coke behind. These volatile portions are carried off through the pipe 28 and by means of suitable condensing apparatus a large portion thereof is recovered in the form of a moderately heavy hydrocarbon oil.

I find in practice that some free gases are formed, but that the amount of these free gases can be greatly reduced by a careful regulation of the temperatures within the stack. The steam pipe 20 is utilized when the temperatures rise too high, the steam being passed through the stack tending to lower this temperature and prevent fusion of the balls and too much destructive distillation of the oil fed therein.

Obviously other types of apparatus might be utilized to carry on my process which is defined fully by the claims annexed hereto.

I claim as my invention:—

1. A process of distilling bituminous

matter which comprises feeding said matter into an enclosed chamber; feeding balls of incombustible material into said chamber; maintaining a combustion zone in a portion of said chamber, said chamber being so formed that the hot gases from said combustion zone pass between the spaces between said balls and reduce said bituminous matter to coke before said balls and bituminous matter reach said combustion zone; and removing said balls after they have passed through said combustion zone so that they may be subsequently fed back into said chamber.

2. A process of distilling bituminous matter which comprises feeding said matter into an enclosed chamber; feeding cast iron balls into said chamber; maintaining a combustion zone in a portion of said chamber, said chamber being so formed that the hot gases from said combustion zone pass between the spaces between said balls and reduce said bituminous matter to coke before said balls and bituminous matter reach said combustion zone; and removing said balls after they have passed through said combustion zone so that they may be subsequently fed back into said chamber.

In testimony whereof, I have hereunto set my hand, at the city of London, Kingdom of England, this 24th day of March, 1920.

WILLIAM MEISCHKE-SMITH.