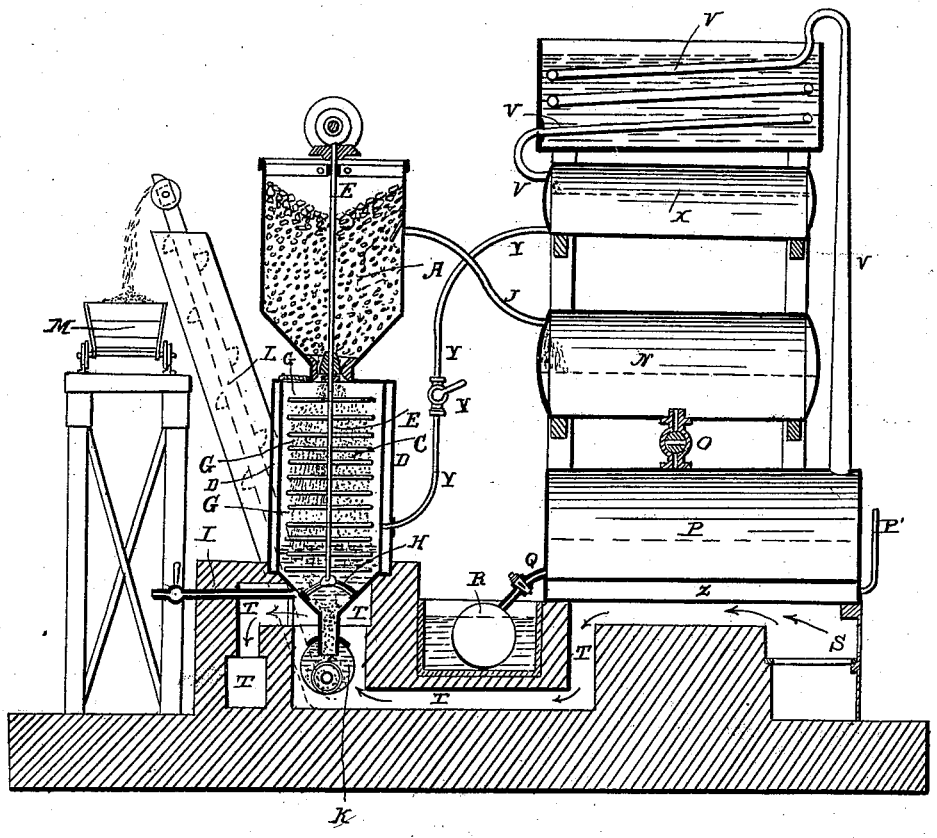
H. P. GENGEMBRE.

Apparatus for Extracting Oil, &c., from Minerals.

No. 52,284. Patented Jan. 30, 1866.



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H. P. GENGEMBRE, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN APPARATUS FOR EXTRACTING OIL, &c., FROM MINERALS.

Specification forming part of Letters Patent No. **52,284**, dated January 30, 1866.

To all whom it may concern:

Be it known that I, H. P. GENGEMBRE, of the city of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Apparatus for Extracting Oil, Paraffine, Bitumen, &c., from Minerals Containing the Same; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which is a sectional elevation of the whole apparatus, explaining so clearly the different parts as to require no other views.

The nature of my invention consists in an apparatus so constructed as to submit to the action of a solvent or solvents, in a rational, continuous, and progressive manner, the mineral containing oil, paraffine, or bitumen, and to recover the solvent or solvents by separating it or them from the oil, paraffine, or bitumen by a peculiar distillation.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and mode of operation.

A is a vessel of cylindrical or other form, made of iron or lined wood. This vessel has a bottom shaped as a funnel, and at the bottom it has a mill or crusher, B. This crusher is made something like a coffee-mill, but rollers or any other shape may answer as well. The vessel A rests on and communicates with a second vessel, C, which can be made of any desired shape, although I prefer it of a cylindrical one. It has its lower part terminated as a funnel, and has all over or over a part of it a steam-jacket, D D, so that it can be heated at pleasure.

E is a shaft or axis placed in a vertical position in the center of the vessels A and C. This shaft E is acted upon by suitable machinery or gearing, so as to receive a rotary or oscillating movement, and it is used to turn or move the mill or crusher B. The plates *b b b b*, &c., are flat disks or circular plates, perforated with a few holes, and fast on the axis or shaft E, so that any motion of said shaft will cause the disks or circular plates to be moved.

H is an arch and rest or step which supports the shaft E and keeps it in its proper place.

K is a pipe lying horizontally, and having in its lower part a helix or screw operating in the manner of those used for transferring grain from one place to the other in a horizontal direction.

L is an elevator of any desired construction to carry up and away the sand or small particles of mineral which are brought to it by the helix in the pipe K.

M is the wagon to receive the spent mineral. I is a steam-pipe coming from a steam-boiler, and provided with a steam-valve.

J is a pipe leading from the vessel A to the reservoir N. N is a tank or reservoir communicating with the still P by a cock, O.

P is a still having a double bottom. *p* is the pipe for filling the space between the two bottoms. Q is a valve or cock for emptying the still P.

R is a tank to receive the oil, paraffine, or bitumen after all the solvent or solvents have been driven off from them by the heat of the still P.

S is the furnace. T is the smoke-flue. U is the pipe leading from the still P to the cooler or worm V. V is the worm or cooler.

X is a tank to receive the solvent, and Y Y is the pipe and valve to lead the solvent from the reservoir X to the vessel C.

If the worm V and receiver X are placed lower than they are represented in the drawings, a force-pump will be introduced in pipe Y to supply the place of the head.

Operation: The mineral to be treated is first reduced to lumps of proper size and thrown into the vessel A until it is full. A certain quantity of water is introduced, so as to fill the pipe K and part of the vessel C, and the cock Y is open, allowing the solvent to run into the vessels C and A until it overflows by the pipe J. The temperature of the vessel C is raised by admitting steam into the jacket D, and steam is also admitted by the pipe I for the same purpose. When the apparatus has obtained the proper heat, which must vary according to the mineral treated or the solvent used, the machinery is put into motion, the cock Y is again open, and the vessel A kept supplied with fresh mineral, so as to have always some mineral over the surface of the solvent. The mineral softened by the action of the solvent is easily ground by the mill or crusher B, and reduced to small particles which fall upon the

revolving disk or table G′. The motion of the disk G′ will cause the small particles of mineral to be agitated and washed by the solvent, and also to fall through the holes in the disk G′ to the next disk, and so on from one to the other. This will keep the small particles of mineral a long time in contact with the heated solvent, and as they descend they come in contact with cleaner solvent.

I have represented but one of the vessels C; but if a mineral requires to be washed by the solvent a longer time, two or more vessels, as the one represented by C, can be put one under the other.

The clean solvent arriving by the pipe Y will drive upward in the vessel C and in the vessel A the solvent already charged with oil, paraffine, or bitumen, which will overflow by the pipe J, while the small particles of mineral, thoroughly cleansed from oil, paraffine, or bitumen, will reach the heated water in the lower part of the vessel C. There, partly by mechanical action, partly by reason of the difference of specific gravity between the solvent and the water, and partly by process of distillation, all the solvent will be expelled from the particles of spent mineral, which will collect in the pipe K and be taken by the helix or screw to the elevator L, and be carried away out of the apparatus.

The process can now go on in a continuous manner, the solvent, saturated with oil, paraffine, or bitumen, accumulating in the reservoir N. When the reservoir N is full the cock O is open and the contents of the tank N are transferred to the still P, the cock O is shut, and the process goes on.

In the space Z left between the two bottoms of the still P a solution of salt in water, or any other baths, is introduced by the pipe *p*. That solution must be such that it will boil at a given point, and that point is determined by the quantity of salt introduced in the solution. This must vary with the nature of the mineral and solvent, but must be so regulated that it will guide the distillation so as to expel all the solvent from the still P and retain the oil, bitumen, or paraffine. This arrangement has the great advantage of enabling the fire to remain constantly under the still, even when it is being emptied or filled, without any danger or injury to the still, and it enables any one to conduct the distillation successfully.

The solvent is vaporized, ascends the pipe U, is condensed in the worm V, and received in the tank X, where it is ready to be used again by the pipe Y Y.

As soon as the distillation is over the cock Q is open, the oil, paraffine, and bitumen are run in the cooling-tank R, and, the cock Q being shut, the still P may be at once filled again by the cock O, as before, thus keeping the operation constantly going.

It will be perceived that the fire in the furnace S can remain all the time lighted, and that the lost heat therefrom is utilized in the flues T T to heat the pipe K and the bottom of the vessel C.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The apparatus composed of the vessel A, vessel C, or of two vessels or more, A and C, in combination with the still P, pipes Y and J, tanks N and X, and furnace S, and flues T T, or any modification of the same, working and operating substantially in the same manner, for the purpose specified.

2. The vessel A, crusher B, vessel C, tables *b b b*, &c., shaft E, pipe K, elevator L, pipe Y, and pipes I and J, when used for extracting, by means of a solvent, oil, paraffine, or bitumen from mineral containing the same.

3. The still P, receiver N, double bottom space Z, filled with an aqueous solution of salts, when combined with the worm V, tank X, pipe Y, vessel C, vessel A, pipe J, and furnace S, for recovering the solvent used in the operation and graduating the oil, paraffine, or bitumen obtained to its proper gravity.

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Witnesses:
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