

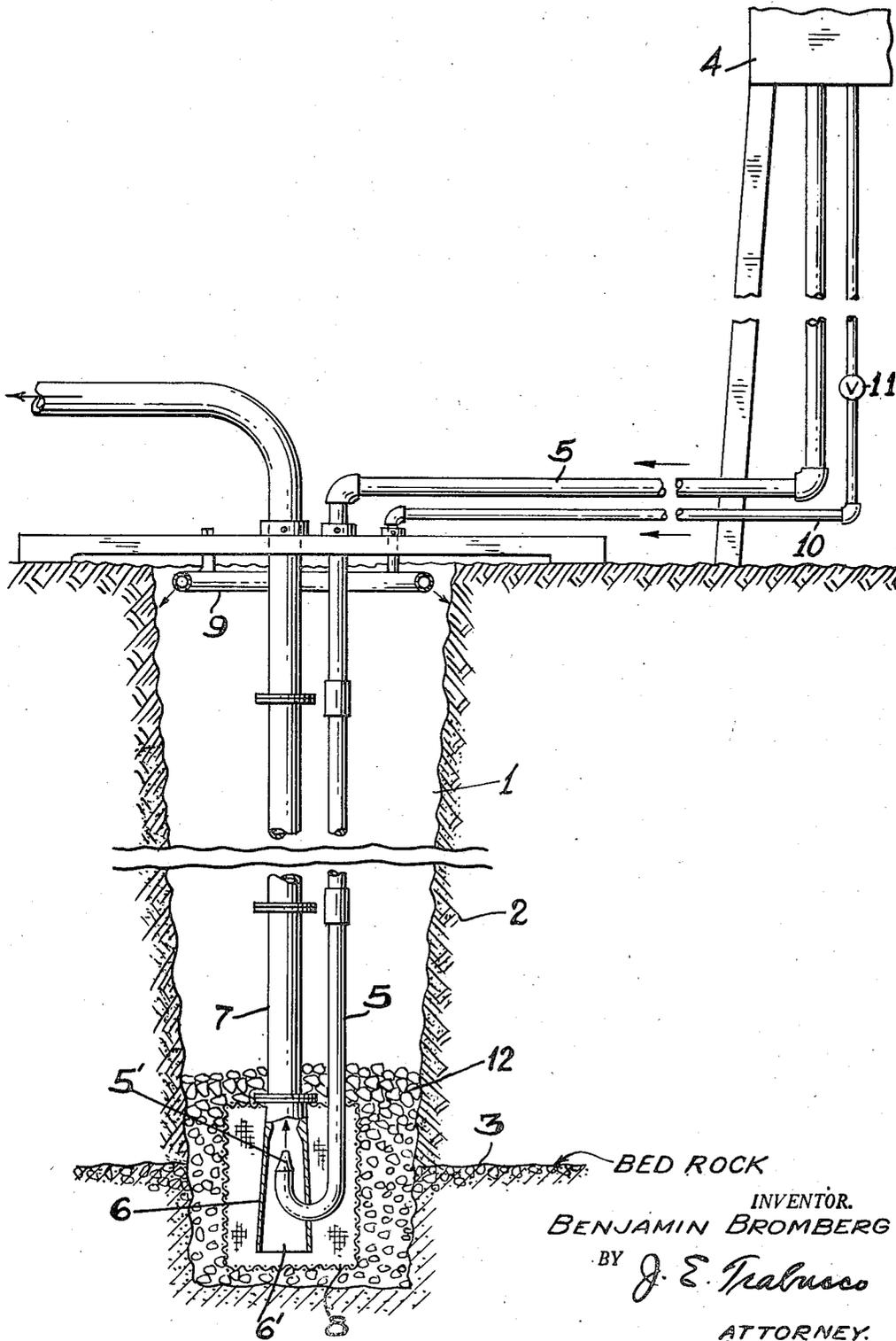
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METHOD OF PLACER MINING

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METHOD OF PLACER MINING

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1

This invention relates to placer mining and more particularly to a novel method by which clay deposits or frozen ground may be treated to permit a more complete recovery of the precious metals carried thereby.

Owing to the plasticity of clay, the small particles of gold, platinum or other precious metal sometimes carried thereby can only be partially recovered by the placer mining methods now commonly employed. Clay is not easily disintegrated, and for this reason all of the small particles of precious metal sometimes carried by clay deposits in certain mining areas are not released by dredging or other commonly practiced methods. As a consequence the recovery is not satisfactory, and the loss of values is considerable.

The present invention provides a novel mining method by which clay deposits may be satisfactorily treated to release the fine particles of precious metal carried thereby.

In areas of the far north and elsewhere where the ground must first be thawed out to permit the carrying on of dredging or other mining operations, my invention provides a novel and highly efficient method by which frozen stratas of clay, gravel or other deposits may be suitably softened to permit the satisfactory and convenient mining thereof.

While the accompanying drawings show, diagrammatically, suitable apparatus used in practicing my invention, it is to be understood that various other combinations or arrangements may be provided for this purpose if conditions or circumstances so demand.

Referring to the drawings, the numeral 1 designates a substantially vertical shaft extending through a strata of clay 2 or other similar deposit which carries particles of gold, platinum, or other precious metal. The shaft preferably extends from the surface of the ground to a point well into the underlying bedrock 3. The sinking or drilling of the shaft may be accomplished by well boring equipment of the kind commonly used, or it may be dug by hand or other suitable methods. If tubular casing is employed during the drilling operations, its removal from the shaft must be effected before the present invention can be satisfactorily practiced.

After the shaft is first prepared in the area to be mined and the walls thereof are fully exposed, the apparatus used in carrying out the present invention is then installed in the customary manner. Extending from a suitably elevated reservoir, tank or other source of water supply 4 is a pressure pipe 5 which extends into the shaft and

2

is connected at its discharge end 5' to a suitably shaped casing or enclosure 6. The discharge end 5' of the pressure pipe extends into the casing and is suitably spaced from the latter's walls. The casing is provided with a material inlet as at 6', through which water and fine particles of clay, precious metal and other material may be drawn from the lower area of the well as suction is created by the discharge of water into the casing from the pressure pipe 5. Extending into the well and connected to the upper end of the casing is a discharge pipe 7 which is arranged to convey the water delivered by the pressure pipe 5 and also the material entering the casing to the surface of the ground and there discharge the same into settling tanks or elsewhere, depending on whether it is found that values are recoverable therefrom.

Extending around the casing 6 and particularly the inlet 6' is a screen 8 which permits only water and particles of material of a certain size to be drawn into the casing. The screen may be arranged in any suitable manner, but preferably it has a sufficient area to permit the continued flow of material from the lower area of the well into the casing 6, irrespective of whether a certain part thereof is clogged or not.

Suitably supported at the upper end of the shaft 1 is a ring-shaped spraying device 9 which is connected by a pipe 10 to the reservoir 4 or other source of water supply. A control valve 11 connected to the pipe 10 permits the flow of water from the spraying device 9 to be regulated in accordance with variable requirements. The spraying device sprays water continuously against the sides of the shaft. A quantity of gravel 12 deposited into the shaft extends well above the top of the screen 8.

In operation, the water discharged into the casing 6 by the pressure pipe 5 is forced upwardly through the discharge pipe, thereby creating sufficient suction to draw such material from the lower area of the shaft as is capable of passing through the screen into the casing through the inlet 6'.

Water flowing through the pipe 10 is directed by the spraying device 9 against the side walls of the shaft 1, and as it continues to flow downwardly along the said walls the process of erosion attacks the clay deposit 2, thereby causing particles thereof to be continuously released and carried to the bottom of the shaft. The smaller particles of the clay deposit or other eroded material which are released and are carried downwardly by the water emitted from the spray-

3

ing device are drawn through the screen and into the casing 6 through the inlet 6'. The continuous suction created by the upward flow of water through the discharge pipe conveys the water and finer particles of material which pass through the screen to the surface of the ground where they are disposed of in any suitable manner.

As the diameter of the shaft increases with the gradual wearing away of its side walls, the valve 11 may be adjusted from time to time to cause sufficient water to be delivered to the spraying device to cause the process of erosion to proceed uninterruptedly. The enlargement of the upper areas of the shaft may proceed indefinitely, or until the water sprayed against its sides no longer reaches the inside of the screen, for instance as when the bedrock by its inclination intercepts and carries it away. After the shaft has increased in width to an extent where the apparatus no longer functions efficiently, the pipes may be removed and installed in another nearby shaft. When the ground has been sufficiently broken up and treated in the manner described, dredging or other suitable mining operations may be successfully employed to recover the gold or other precious metal released from the clay deposit and still remaining in the lower areas of shafts.

The present invention is particularly well suited for thawing frozen ground, preparatory to the carrying on of dredging or other mining operations. The flow of comparatively warm water down the sides of the shaft causes a fairly rapid thawing of the surrounding ground. It is to be understood that other methods may be used to direct water onto the sides of the shaft other than by spraying.

What I claim is:

1. A method of mining which consists in sinking a shaft in an area to be mined, directing water against the sides of the shaft and allowing it to flow downwardly thereon, whereby particles of material from the sides are released and carried to an area at the bottom of the shaft, screen-

4

ing the finer particles from those that are coarser, and conveying the finer particles together with the water directed against the sides of the shaft to the surface of the ground.

2. A method of mining which consists in sinking a shaft in an area to be mined, spraying water against the walls of the shaft at points near the surface end of the latter, and directing the water down the shaft's walls to an area in the shaft near its bottom end, whereby particles of material from the ground at the sides of the shaft may be released and carried to the shaft's bottom, screening the finer particles from those which are of a predetermined larger size at a point in the lower end of the shaft, and conveying the smaller screened particles together with the water directed down the walls of the shaft to the surface of the ground.

3. A method of mining which consists in sinking a shaft in an area to be mined, directing a continuous flow of water down the sides of the shaft and in contact with its said sides, whereby particles from the sides of the shaft are released and carried to the bottom of the shaft, and continuously screening particles of a certain size from those of a larger size, and continuously conveying by suction the screened smaller particles and the water from the bottom of the shaft, to the surface.

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