No. 659,148. Patented Oct. 2, 1900.

F. P. HOPKINS & L. MANZKE.

GOLD SEPARATOR.

(Application filed Feb. 17, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

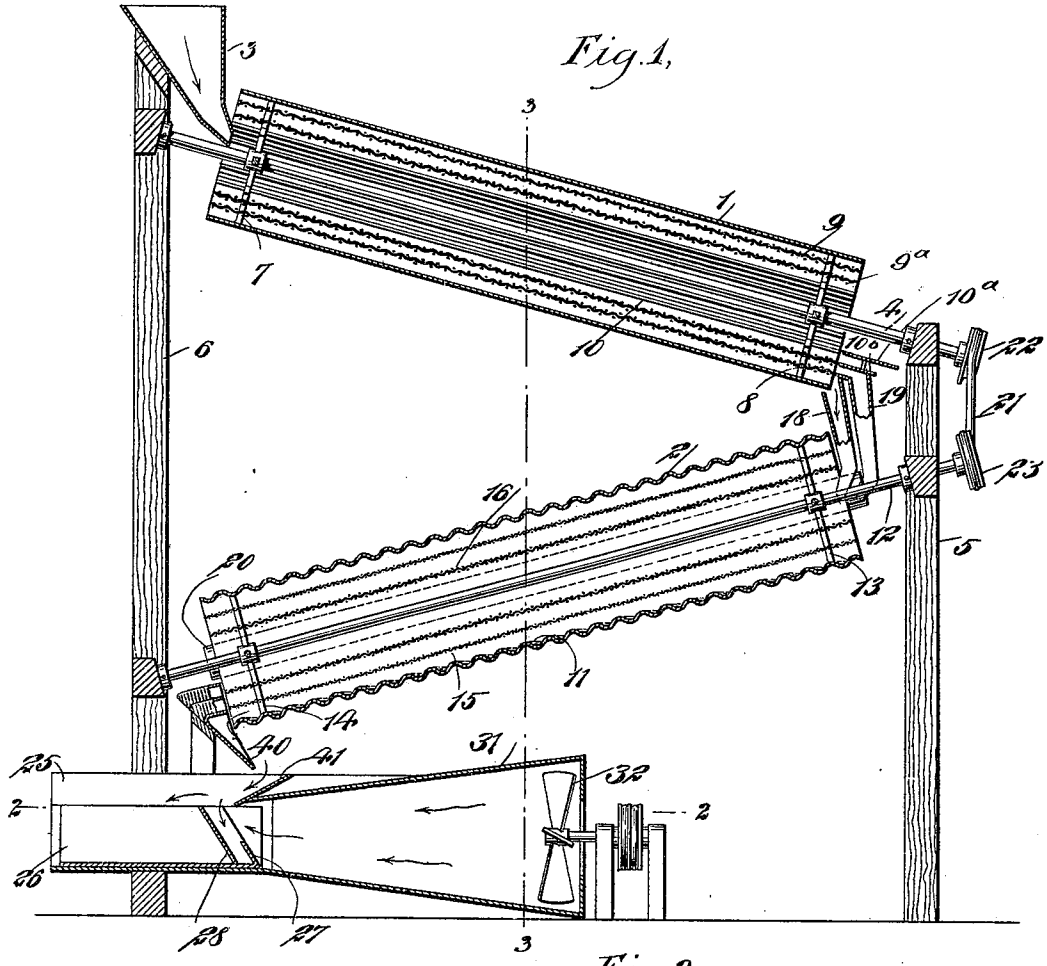
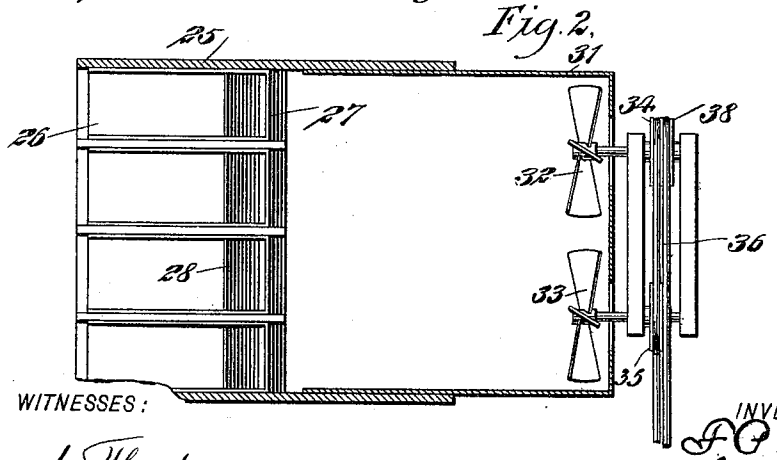


Fig. 2.



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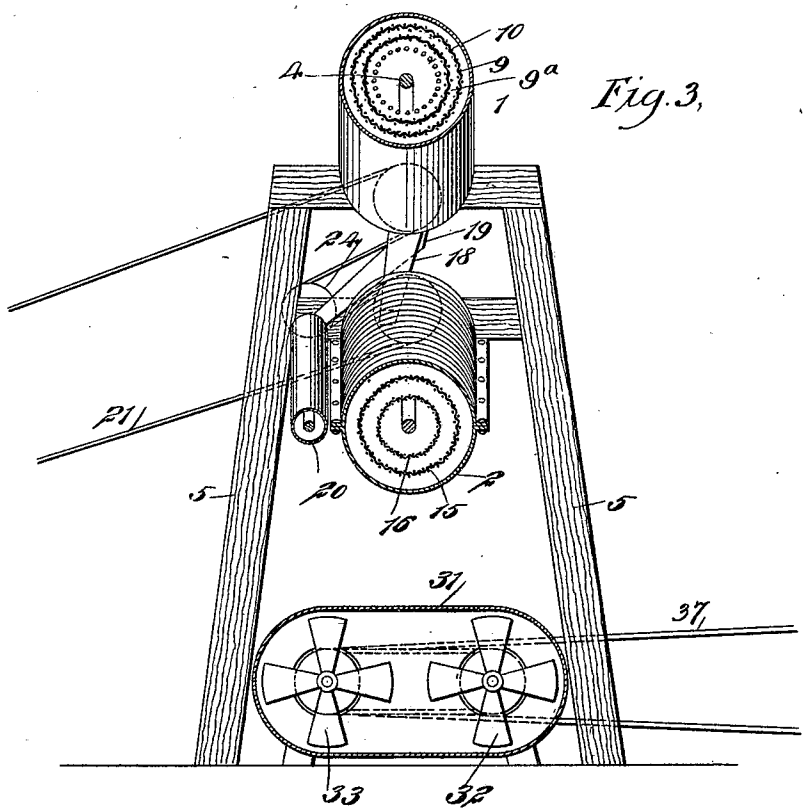


Fig. 3.

Fig. 4.

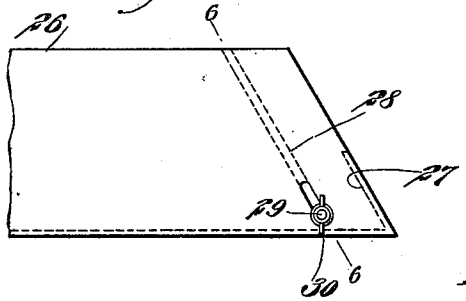


Fig. 5.

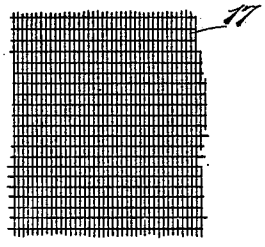
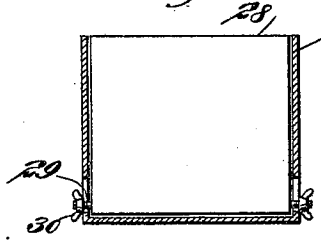


Fig. 6.



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UNITED STATES PATENT OFFICE.

FRANK PAYONETTE HOPKINS AND LOUIS MANZKE, OF SPIRIT LAKE, IOWA.

GOLD-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 659,148, dated October 2, 1900.

Application filed February 17, 1900. Serial No. 5,581. (No model.)

To all whom it may concern:

Be it known that we, FRANK PAYONETTE HOPKINS and LOUIS MANZKE, citizens of the United States, and residents of Spirit Lake, in the county of Dickinson and State of Iowa, have invented a new and Improved Gold-Separator, of which the following is a full, clear, and exact description.

This invention relates to improvements in machines for separating gold or other precious metals from sand or gravel in a dry state; and the object is to provide a simple machine by means of which the values may be quickly separated from sand or gravel.

We will describe a gold-separator embodying our invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional elevation of a separator embodying our invention. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is a section on the line 3 3 of Fig. 1. Fig. 4 shows a portion of a receiving-drawer of modified form. Fig. 5 represents a form of screen employed, and Fig. 6 is a section on the line 6 6 of Fig. 4.

The machine comprises two cylinders 1 2, open at each end and both inclined in opposite directions, the discharge end of the upper cylinder being arranged to discharge material into the lower cylinder. At the upper end of the cylinder 1 is a feed-hopper 3, and this upper cylinder is mounted on a shaft 4, having bearings in frame uprights 5 6. The cylinder is connected to the shaft 4 by means of spiders 7 8, near the ends of the cylinder, and arranged within this cylinder are cylindrical screens 9 and 9^a, and within the screen 9^a is a gravel screen or sieve consisting of longitudinally-extended bars 10, supported by the spiders 7 and 8.

The lower cylinder 2 is provided with annular corrugations, which provide pockets for receiving quicksilver 11. This cylinder 2 is mounted on a shaft 12 by means of spiders 13 14, and arranged within the cylinder are two screens 15 16, of cylindrical form. It may be here stated that the several screens are of different-sized mesh—that is, the screen 16 is of finer mesh than the screen 9, the screen 15 is of finer mesh than the screen 16, and the screen 9^a has the coarsest mesh of all. Preferably the openings will be oblong, as indicated at 17 in Fig. 5. By this construction of screen thin pieces of gold will be permitted to pass through, which would not be possible with screens having a small square mesh. The material from the upper cylinder 1, or rather the body portion thereof, is designed to pass through a chute 18 into the inner screen 16 of the lower cylinder, and heavy particles, such as gravel, that cannot pass through the screen or sieve 16 or through the screen 9 are discharged through a chute 19 into a pipe 20, mounted to rotate at the side of the cylinder 2. The object in rotating the pipe 20 is to cause the gravel to move freely.

The cylinders 1 and 2 and the gravel-pipe 20 are rotated by means of a band 21, driven by any suitable motor and extended around pulleys 22 and 23 on the respective shafts 4 and 12 and also around a pulley 24 on the shaft supporting the pipe 20.

Arranged below the outlet end of the cylinder 2 is a casing 25, in which a number of receiving-drawers 26 are removably placed. Each receiving-drawer at its inner end has a partition 27 extended about half-way up the height of the drawer and inclined forward, and forward of this partition 27 is a partition 28, that is also inclined or parallel with the partition 27; but these partitions 28 extend to the full height of the drawer, as plainly indicated in Fig. 1. The partitions 28 may be made adjustable as to their degree of inclination or as to their extension above the top of the drawer. In Figs. 4 and 6 we have shown the partitions 28 as provided with bolts 29, passed through vertical slots in the sides of the drawers, and on the outer ends of these bolts are set-nuts 30.

Rearward of the series of drawers 26 is a fan-casing 31, in which two fans 32 33 are arranged, the wall of the casing 31 rearward of the fans being provided with openings through which air may be drawn. Pulleys 34, 35, and 38 on the shafts of the fans 32 and 33 are connected by an endless band 36, operated by a suitable motor.

In operation the pay-dirt is put into the

hopper 3 by any suitable means. From this hopper the material passes to the gravel-screen 10. The parts not capable of passing through said screen will run out at the back end from a platform 10^a to a dump or other suitable receptacle. The parts or sizes of material that pass through the meshes of the screen 10 are caught by the screen 9^a, and the material that will not pass through the mesh of this screen is discharged over a chute 10^b to the dump. The material that passes through the screen 9^a is caught by the screen 9, and the sizes that will not pass through the mesh of this screen 9 will discharge into the chute 19, which delivers the same into the rotating pipe 20, and thence onto one of the partitions 28, where the gold is separated from the gravel. The material that passes through the screen 9 is caught by the cylinder 1 and led by the chute 18 into the screen 16 of the lower cylinder. The material passing through the screen 16 will be caught by the screen 15 and will run out at the lower end onto one of the partitions 28. The sizes of sand or gravel that pass through the screen 15 are caught by the corrugated cylinder, and a portion of this material will be discharged onto a partition 28, where the gold not caught by the quicksilver in the corrugations is separated from the sand or gravel by the air blast.

We have used the expression "discharging on the partitions 28;" but there will be very little sand or gravel actually touching the partitions, the real separating at the lower end being done by the air-blast while the material is passing from a chute 40 to an inclined plate 41 and thence to a partition 28.

Having now described our invention, we claim as new and desire to secure by Letters Patent—

1. A gold-separator, comprising two rotary cylinders inclined in opposite directions and one arranged above the other, the upper cylinder having two cylindrical screens spaced apart and of different mesh and also having a gravel-screen consisting of longitudinally-placed bars, the bars being spaced apart, two cylindrical screens in the lower cylinder spaced apart and of different mesh, a chute for feeding material from the upper cylinder to the interior screen of the lower cylinder, a rotary pipe arranged at one side of the lower cylinder, a chute for discharging material from a screen of the upper cylinder into the said pipe, a series of receptacles for receiving material discharged from the lower cylinder and from said pipe, deflecting-plates arranged in said receptacles, and means for causing an air-blast to separate fine sand or the like from the values passing into the receptacles, substantially as specified.

2. A gold-separator, comprising two rotary cylinders inclined in opposite directions and one arranged above the other, the upper cylinder having two cylindrical screens spaced apart and of different mesh and also having a gravel-screen consisting of longitudinally-placed bars, two cylindrical screens in the lower cylinder spaced apart and of different mesh, a chute for feeding material from the upper cylinder to the interior screen of the lower cylinder, a rotary pipe arranged at one side of the lower cylinder, a chute for discharging material from a screen in the upper cylinder into said pipe, a receptacle for receiving material discharged from the lower cylinder and from said pipe, and an air-blast device for operating upon material passing into the receptacle, substantially as specified.

In witness whereof we have signed our names to this specification in the presence of two subscribing witnesses.

FRANK PAYONETTE HOPKINS.
LOUIS MANZKE.

Witnesses to the signature of Frank P. Hopkins:
J. W. BRANDON,
WM. HAYWARD.
Witnesses to the signature of Louis Manzke:
W. C. DON CARLOS,
F. H. FERGUSON.