

(No Model.)

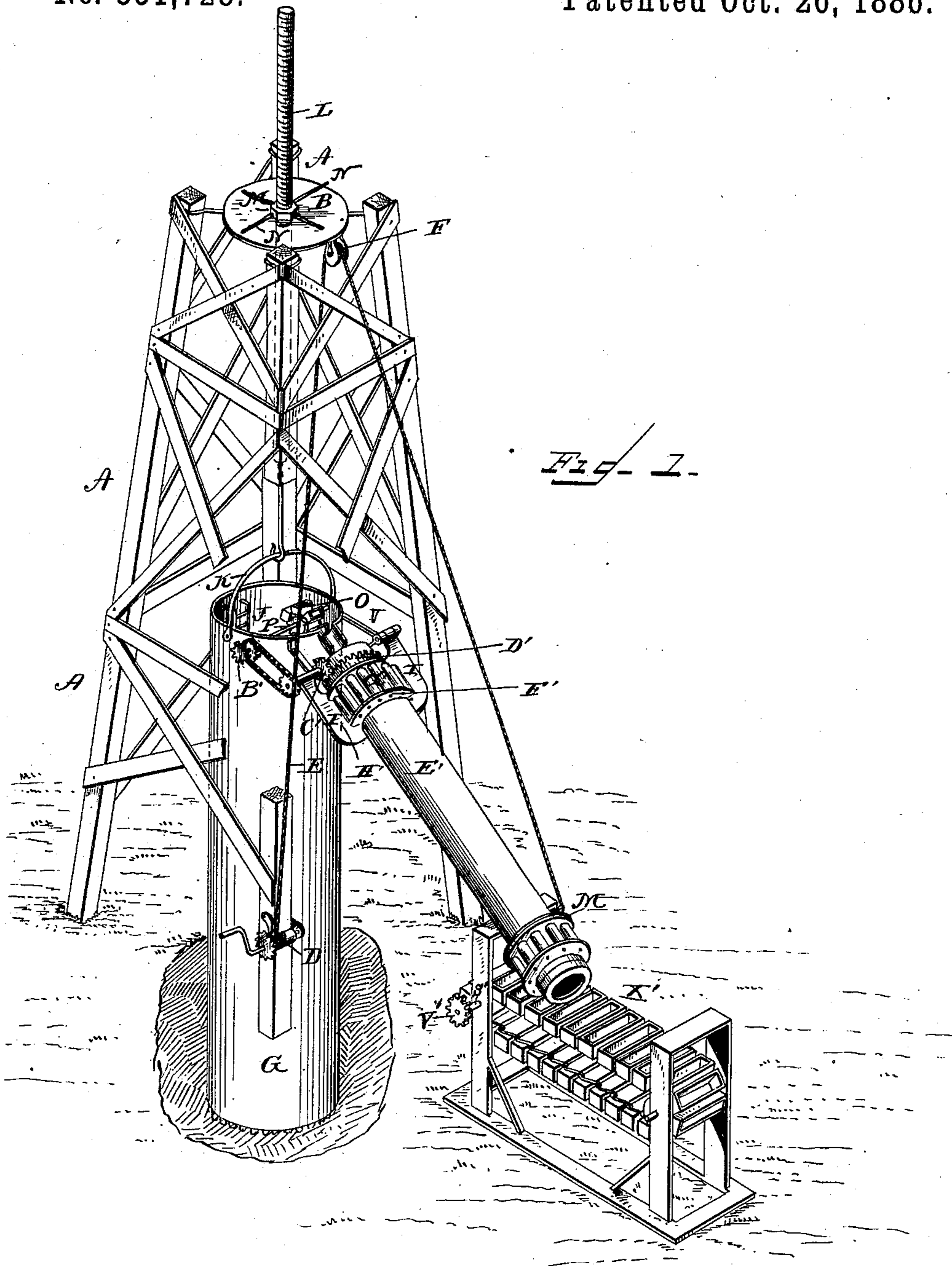
3 Sheets—Sheet 1.

C. ZIMMERMAN.

APPARATUS FOR MINING AND AMALGAMATING GOLD.

No. 351,728.

Patented Oct. 26, 1886.



WITNESSES  
F. L. Ourand  
Edward Stewart

INVENTOR  
Casper Zimmerman  
By Louis Bagger & Co.  
Attorney S.

(No Model.)

3 Sheets—Sheet 2.

C. ZIMMERMAN.

APPARATUS FOR MINING AND AMALGAMATING GOLD.

No. 351,728.

Patented Oct. 26, 1886.

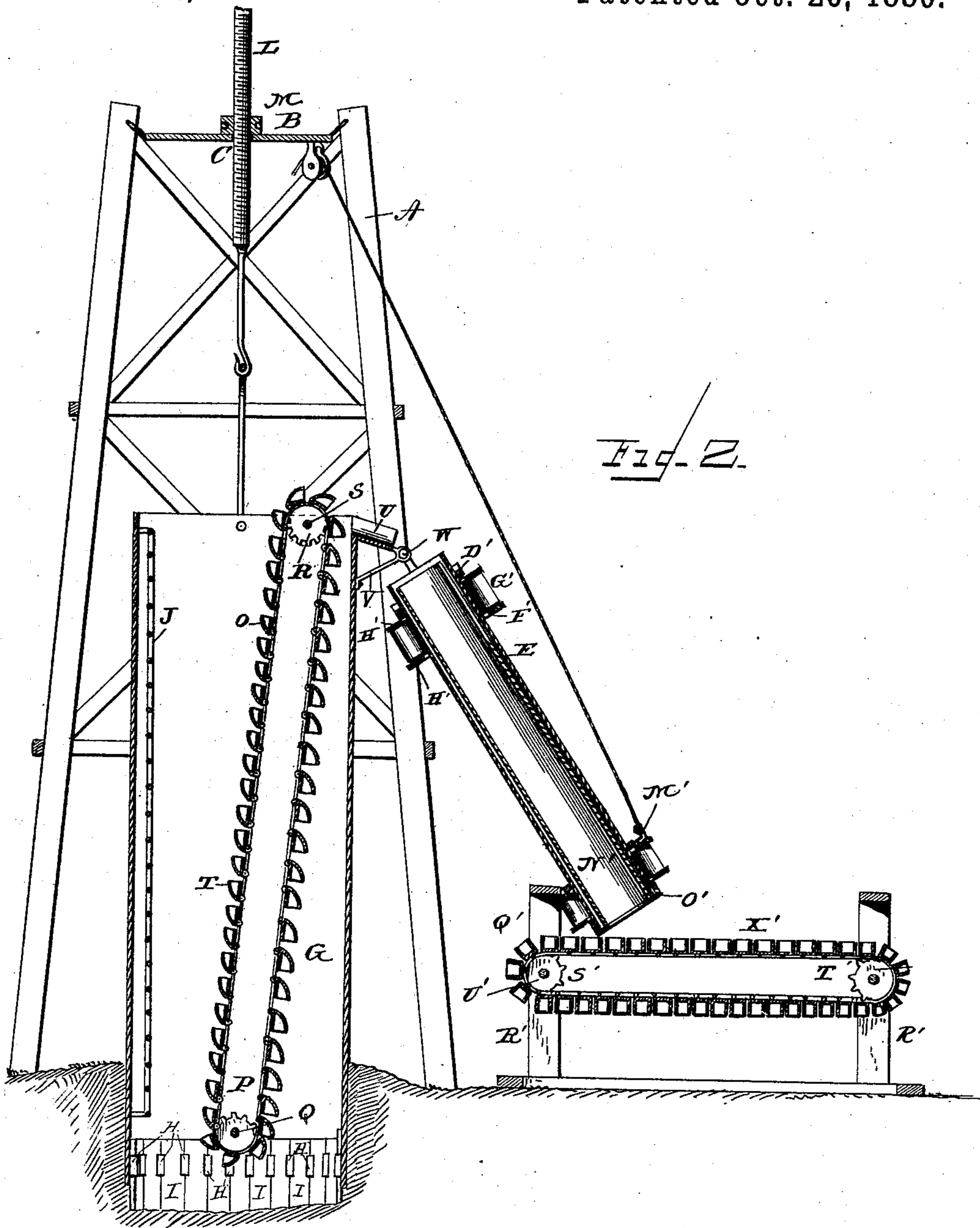


Fig. 2.

WITNESSES

*F. L. Ourand*  
*Edward Skentz*

INVENTOR

*Casper Zimmerman*  
*By Louis Bragger & Co*  
Attorney-S.

(No Model.)

3 Sheets—Sheet 3.

C. ZIMMERMAN.

APPARATUS FOR MINING AND AMALGAMATING GOLD.

No. 351,728.

Patented Oct. 26, 1886.

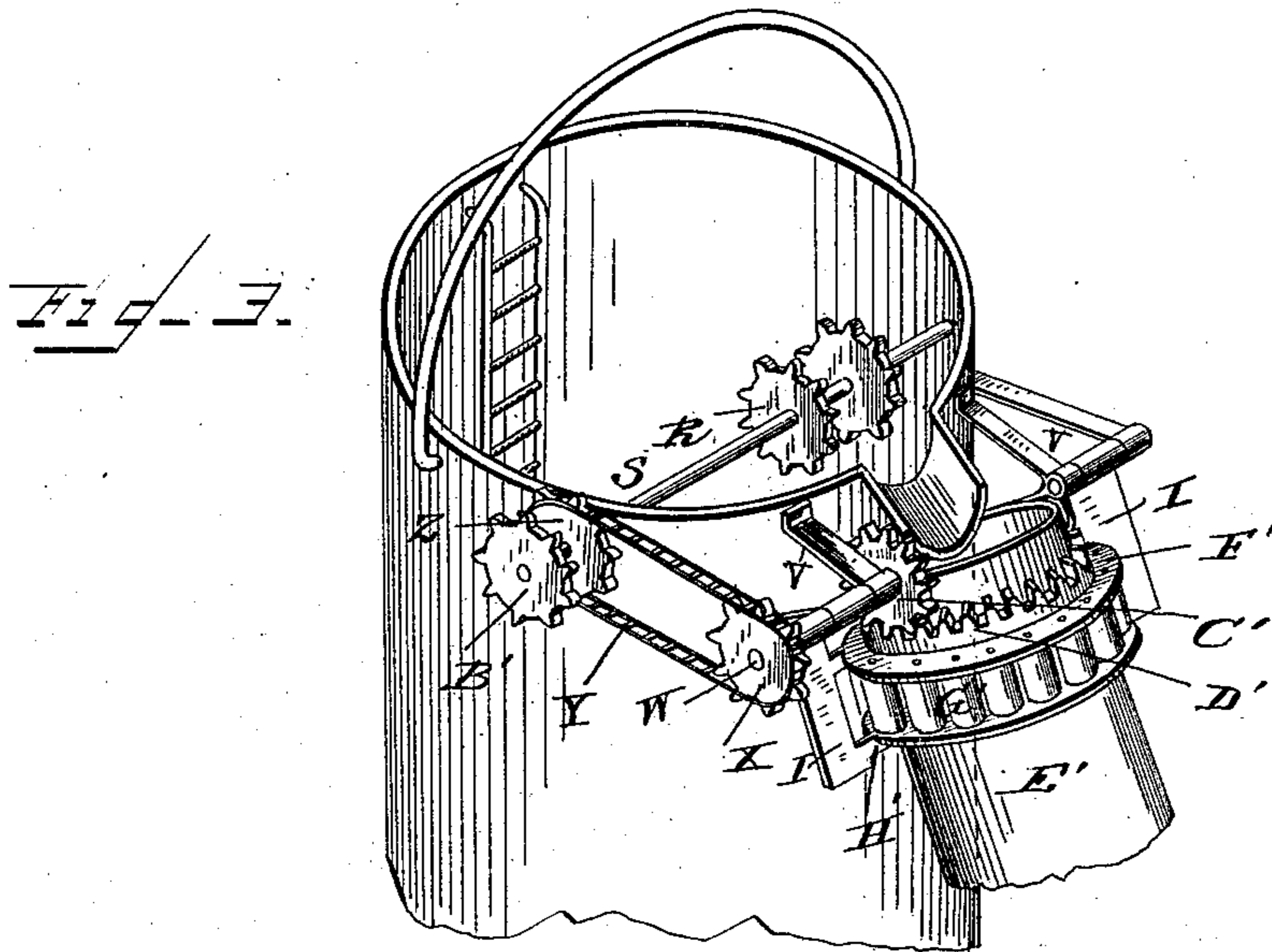
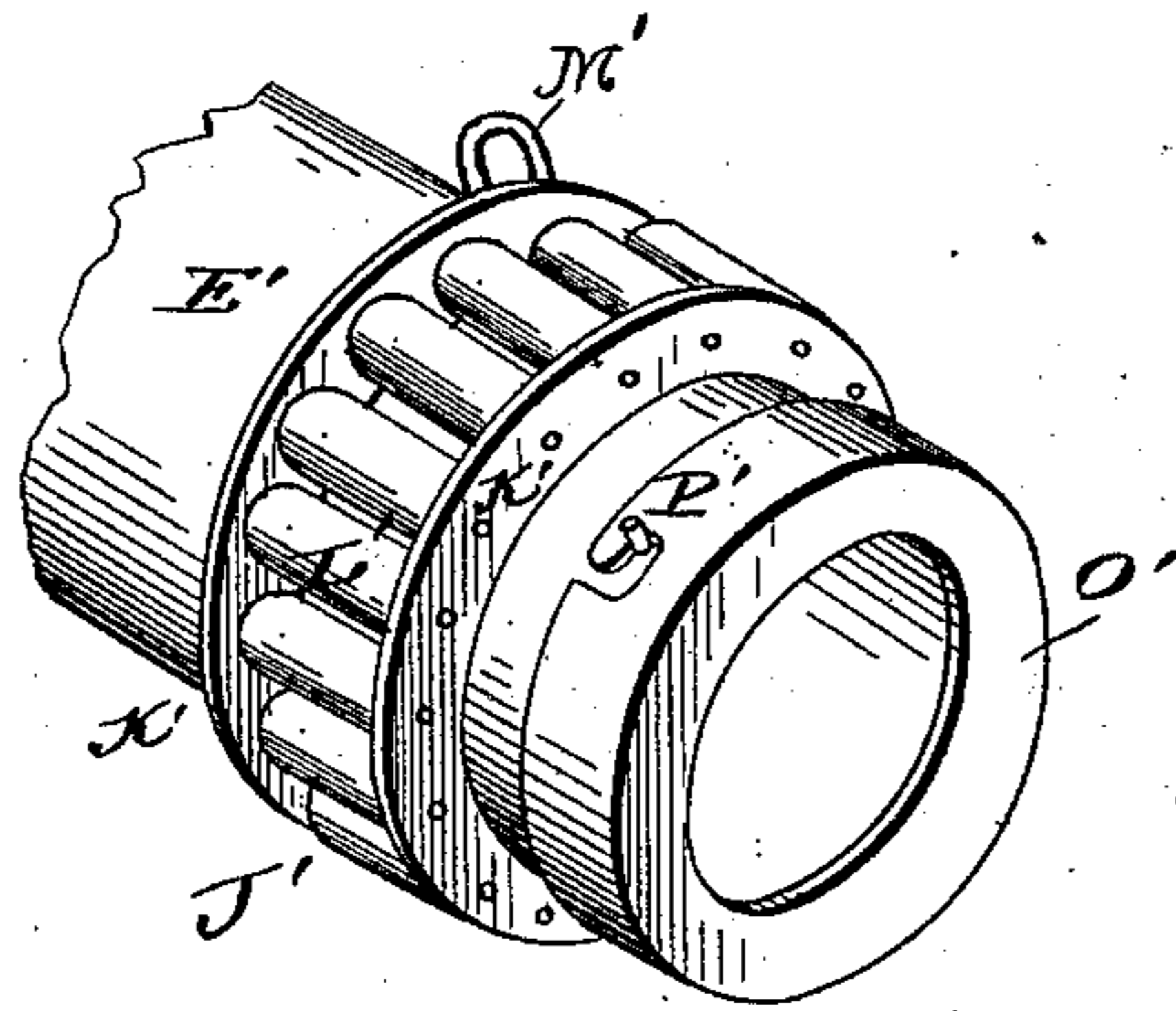


Fig. 4.



WITNESSES

*F. L. Ouraud*  
*Edward Stanton*

INVENTOR

*Casper Zimmerman*  
By *Louis Baigge & Co.*  
Attorneys.

# UNITED STATES PATENT OFFICE.

CASPER ZIMMERMAN, OF TOMAH, WISCONSIN.

## APPARATUS FOR MINING AND AMALGAMATING GOLD.

SPECIFICATION forming part of Letters Patent No. 351,728, dated October 26, 1886.

Application filed April 16, 1886. Serial No. 199,072. (No model.)

*To all whom it may concern:*

Be it known that I, CASPER ZIMMERMAN, a citizen of the United States, and a resident of Tomah, in the county of Monroe and State of Wisconsin, have invented certain new and useful Improvements in Apparatus for Mining and Amalgamating Gold; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a perspective view showing my improved gold mining and separating or amalgamating apparatus in position for operation. Fig. 2 is a vertical sectional view of the entire apparatus. Fig. 3 is a perspective detail view of the upper end of the sinking-tube and of the dirt-conveying tube; and Fig. 4 is a similar view of the lower end of the dirt-conveying tube.

Similar letters of reference indicate corresponding parts in all the figures.

My invention has relation to that class of mining and amalgamating apparatus in which the dirt containing the mineral is carried over surfaces coated with quicksilver, which will absorb the precious metal, while the dirt will pass away; and it consists in the improved construction and combination of parts of an apparatus in which a tube is sunk through the loose dirt down to the so-called "bed-rock," from the surface of which the mineral is removed by means of amalgam, the dirt in the meanwhile being carried over a surface covered with quicksilver, which will absorb any particles of mineral, and in the improved method of mining and amalgamating the mineral, as hereinafter more fully described and claimed.

In the accompanying drawings, the letter A indicates a derrick of a sufficient height, and constructed in such a manner that it may easily be taken apart and transported, and the top of this derrick has a plate, B, supported between the upper ends of the uprights, provided with a perforation, C, while one leg of the derrick has a windlass, D, secured to it, upon which windlass a rope or chain, E, is

wound, which rope passes over a pulley, F, supported at the top of the derrick.

G is a metallic tube of a sufficient diameter to allow a man to work within it, and the lower end of this tube is provided with a number of cleats, H H, between which pass staves or strips I, which may be forced down so as to rest against an uneven surface and close the bottom of the tube. The inner side of the tube is provided with a ladder, J, by means of which a person within a tube may ascend or descend, and the upper end of the tube is provided with a hinged bail, K, to which the lower hooked end of a long screw, L, may be attached, the said screw passing through the perforation in the plate supported at the upper end of the derrick, and having a nut, M, above the plate, provided with arms N, by means of which it may be revolved upon the screw, the revolving of the nut upon the screw either raising or lowering the tube.

An endless elevator-chain, O, passes over wheels P upon a shaft, Q, journaled transversely in the lower end of the tube, and over wheels R upon a shaft, S, journaled transversely in the upper end of the tube, and the buckets T of this elevator may be emptied at the top of the tube into a spout, U, projecting laterally, and downwardly inclined from the top of the tube. The top of the tube is provided with brackets V V, which form bearings at their ends, one bracket at each side of the spout, and a short shaft, W, is journaled in the bearing of one bracket, and is provided with a sprocket-wheel, X, upon its outer end, over which wheel passes a chain, Y, which also passes over a similar wheel, Z, upon the outer end of the shaft Q. To said shaft, outside of the wheel Z, is secured the drive-wheel B', to which the power from the motor is applied in any ordinary manner.

The inner end of the short shaft is provided with a cog wheel or pinion, C', which meshes with a crown-rim, D', upon the upper end of the inclined conveyer-tube E', and an annular frame, F', having anti-friction rollers G' journaled longitudinally between the annular frame-pieces H' of which the frame is composed, fits around the conveyer-tube below the crown-rim, having the tube revolving within it, and is supported by arms I' I', which are hinged to the

short shaft and to the bearing at the other side of the spout, so that the conveyer-tube may be raised or lowered at its lower end, placing it at different angles.

5 An annular frame, J', consisting of annular frame-pieces K' K', having rollers L' journaled with their ends between them, fits around the lower end of the conveyer-tube, bearing with its upper frame-piece against a flange, M', upon the tube, and the end of the rope or chain, winding upon the windlass of the derrick, is secured to this frame, so that the tube may be set at any angle by means of the windlass.

15 A tube, N', having its inner side coated with quicksilver, the tube being copper, fits within the conveyer-tube, and is held within the same by means of a cap, O', having an inwardly-projecting annular flange at its lower end, which bears against the lower end of the tube and fitting upon the lower end of the conveyer-tube, having two L-shaped slots in its upper edge, which may be slipped upon two laterally-projecting pins, P', upon the conveyer-tube.

25 A frame, Q', is placed at the lower end of the conveyer-tube, and extends to the place at which it is desired to deliver the dirt, and this frame is formed with transverse bearings R' R' at its ends, in which revolve shafts S' and T', both having wheels U' upon their middles, and one, S', having a sprocket-wheel, V', upon its outer end, to which power from the motor is imparted in any ordinary way. An endless conveyer-belt, X', passes over the wheels upon the shafts in the frame, and the dirt may fall from the lower end of the conveyer-tube down upon the conveyer-belt and be carried off to the place at which it is desired to dump it. When the apparatus is used, the tube is sunk through the surface dirt, the elevator and the conveyer carrying the dirt up from the bottom of the tube and off from the entire apparatus, and after the lower end of the tube has reached the so-called "bed-rock" all dirt within the tube is cleared away, and the staves or strips at the lower end of the tube are driven down, so as to keep all sand and dirt from entering the lower end of the tube, as it often happens that the said rock is not level, but may be inclined or rough, so that the level end of the tube would not stand upon the rock, and after the dirt has been cleared away the person within the tube may wash off the surface of the rock with a large sponge or similar object, and thereupon remove all particles of mineral in the surface of the rock, by using an amalgam composed of quicksilver and lead filings of the consistency of fresh-churned butter, the amalgam absorbing all traces of mineral upon the surface of the bed-rock.

65 The quicksilver coating upon the inner side of the tube within the conveyer-tube will absorb all particles of mineral which may be contained in the dirt as it passes through the tube, and in this manner all the mineral will be removed from that spot, it being a simple

matter to obtain the gold from the amalgam and to separate the quicksilver for further use.

After the tube has been sunk at one place it may be sunk at another place adjoining it, the derrick being preferably of a sufficient width at its foot to allow the tube to be sunk at several places within its foot before moving it. The conveyer-tube, being revolved, will expose the entire surface of the copper tube to the dirt as it passes through it, and by raising or lowering the outer end of the tube the dirt will pass more or less freely through the tube. The main tube is raised by means of the screw after all gold has been removed from one hole made by the tube, the screw exerting great power in drawing the tube up with the expenditure of only slight power in turning the nut upon the same.

It will be seen that by this method of mining all the mineral is obtained in a convenient form, and the dirt is conveyed in a dry or nearly dry form to any desired place, preventing it from polluting the water in adjacent streams, rendering the apparatus very desirable in regions where hydraulic mining is prohibited by law.

Throughout the specification I have fully described all the operating parts of the apparatus, some of which have heretofore been used in different combinations and for different purposes, and I do not claim the old parts in their old combinations; but the following new constructions and novel combinations I do claim as my invention, viz:

1. In an apparatus for mining and amalgamating gold, the combination of a derrick, a vertical tube suspended from said derrick, a bucket-elevator within the tube, said tube being large enough to permit a man to work within it around the elevator, a revolving tube for receiving the contents of the elevator, provided with means for raising or lowering its inclined outer end, an amalgamator-tube within the revolving tube, and a conveyer for carrying the dirt from the end of the inclined tube, as and for the purpose set forth.

2. In an apparatus for mining and amalgamating gold, the combination of a large vertical tube having an elevator within it, and having a sprocket-wheel upon the end of the upper elevator-shaft, a short shaft journaled in a bracket at the upper end of the tube, and having a sprocket-wheel at its outer end connected to the wheel upon the elevator-shaft by a chain, and having a pinion upon its inner end, an annular frame hinged upon the short shaft and upon a bracket upon the upper end of the tube, and having longitudinal anti-friction rollers, an annular frame having longitudinal anti-friction rollers and supported by a rope or chain from above the upper annular frame, a tube revolving within the annular frames having a flange bearing against the upper end of the lower frame, and having its upper end projecting around a discharge-spout of the vertical tube, and provided at the upper end with

a crown-rim engaging the pinion and at the lower end with laterally-projecting pins, a cap having an inwardly-projecting flange at its lower end and fitting upon the lower end of the tube, and having L-shaped slots in its upper end fitting upon the pins, and a copper tube having its inner side coated with quick-silver, as and for the purpose shown and set forth.

10 3. In an apparatus for mining and amalgamating gold, the combination of a derrick having a plate supported at its upper end formed with a perforation, a vertical large tube provided with a ladder within it and with an elevator, and having a hinged bail at its upper  
15 end, a screw having its lower hooked end engaging the bail and having its upper threaded portion passing through the perforation in the plate of the derrick, and a nut fitting upon the  
20 screw above the plate and having means for turning it, as and for the purpose shown and set forth.

4. In an apparatus for mining and amalgamating gold, the combination of a derrick having a plate supported at its upper end and

formed with a perforation, a vertical large tube having a ladder and an elevator within it, and provided with a hinged bail at its upper end, a screw having its lower hooked end engaging the bail, and having its upper end passing through the perforated plate at the top of the derrick, and provided with a nut above the plate having means for turning it, an inclined revolving conveyer-tube having an interior copper tube coated interiorly with quick-silver, a windlass upon one leg of the derrick having a rope or chain passing from it over a pulley at the top of the derrick and secured to the outer end of the conveyer-tube, and an endless conveyer at the end of the inclined conveyer-tube, as and for the purpose shown and set forth.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in presence of two witnesses.

CASPER ZIMMERMAN.

Witnesses:

C. EMMETT QUIGG,  
JAY MOSHER.