

No. 840,752.

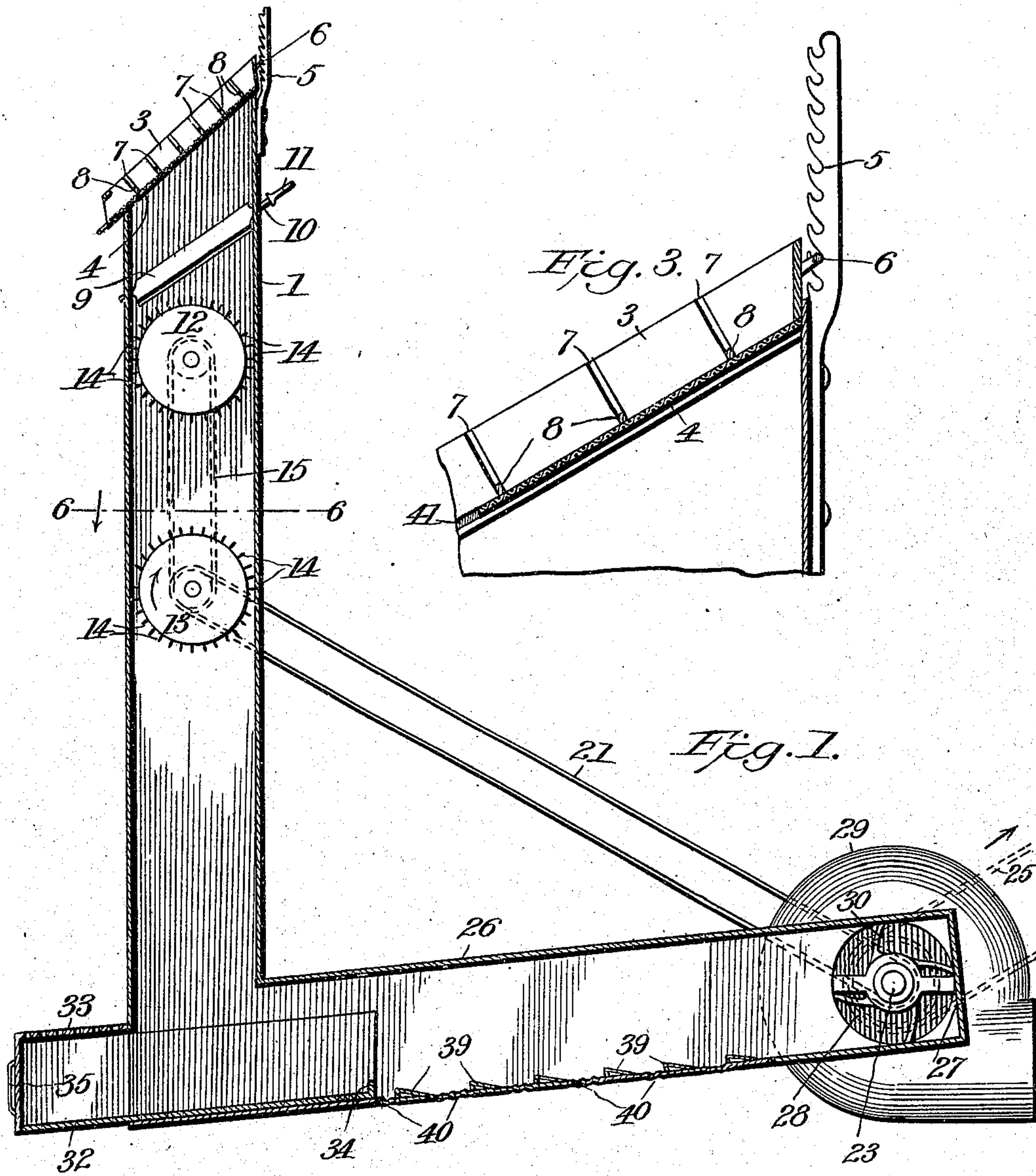
PATENTED JAN. 8, 1907.

J. A. COOMBES.

APPARATUS FOR EXTRACTING AND SAVING GOLD.

APPLICATION FILED NOV. 10, 1905.

2 SHEETS—SHEET 1.



Witnesses

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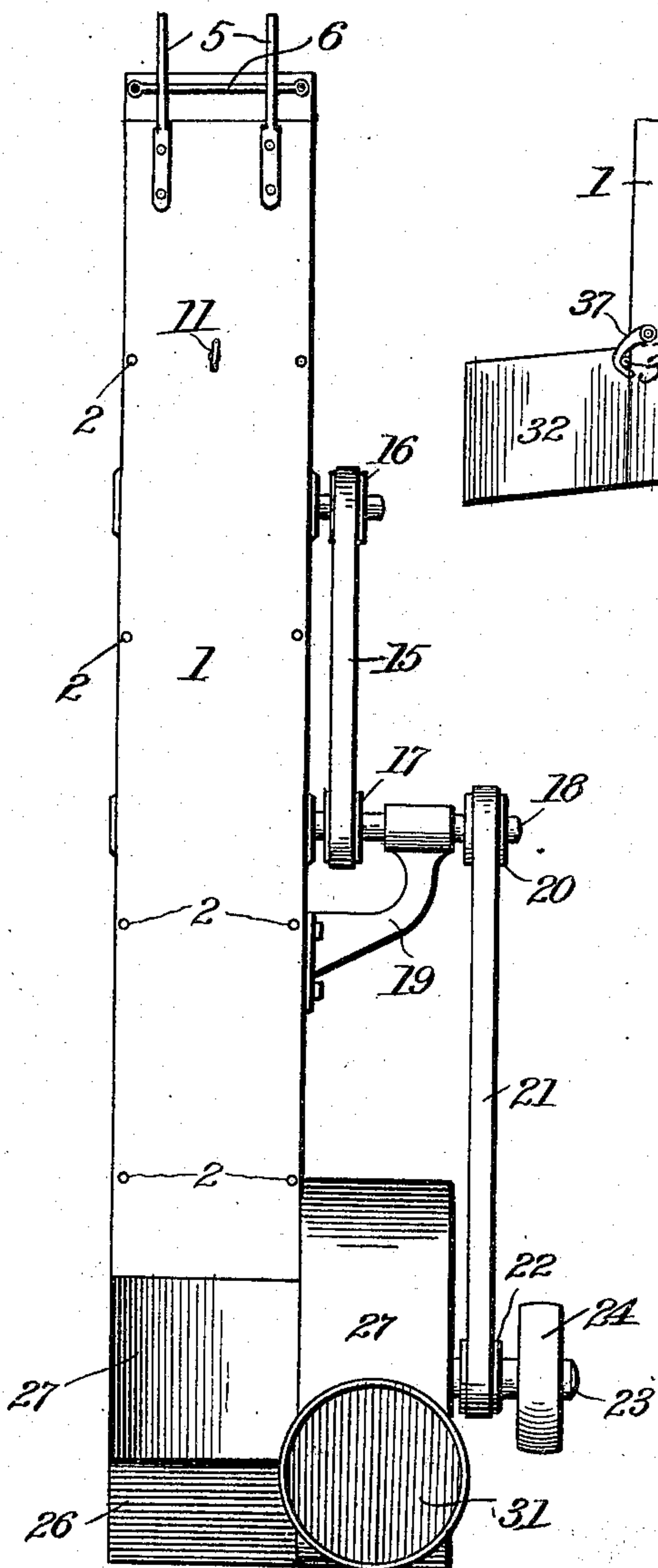


Fig. 2.

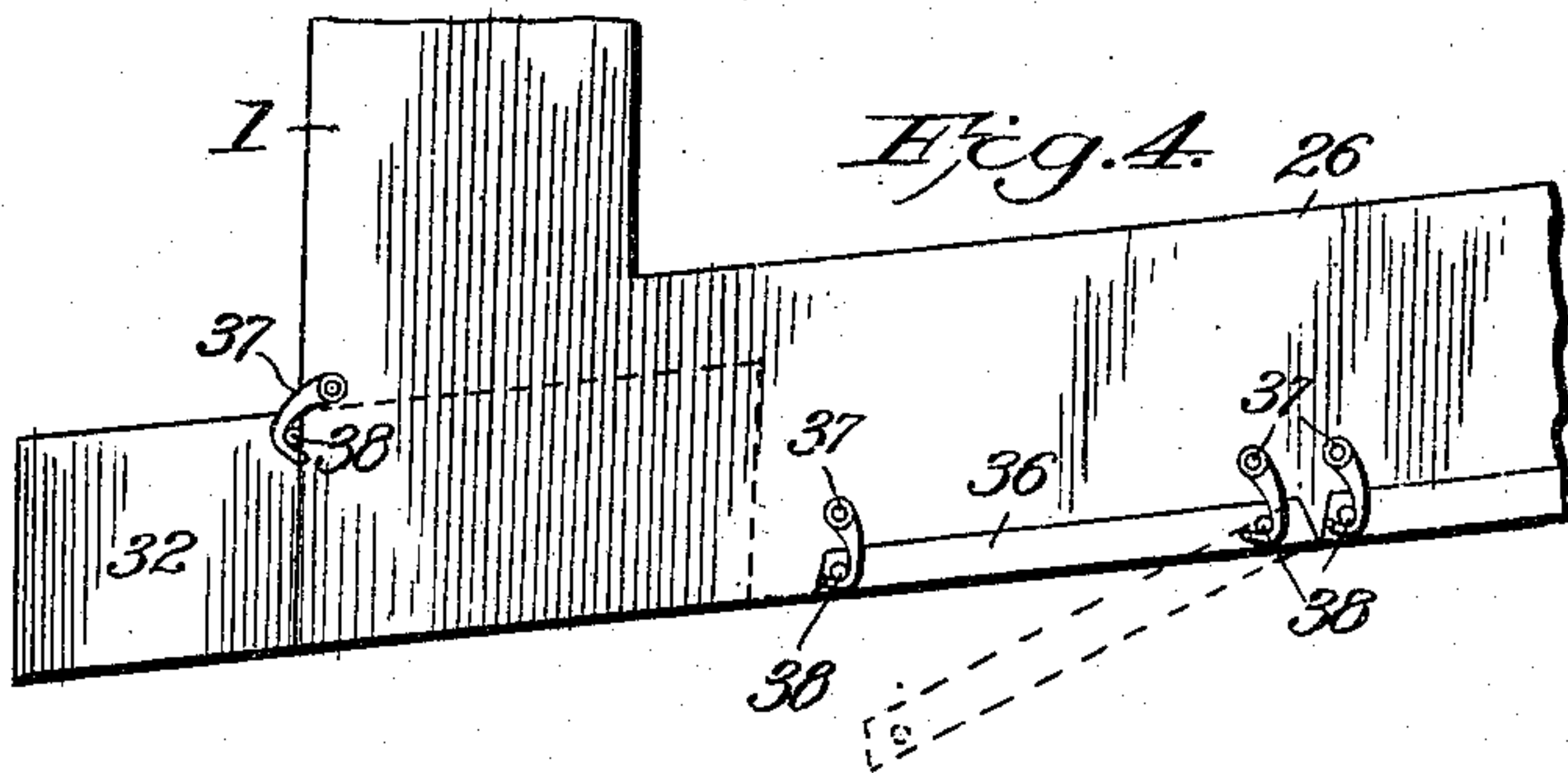


Fig. 4.

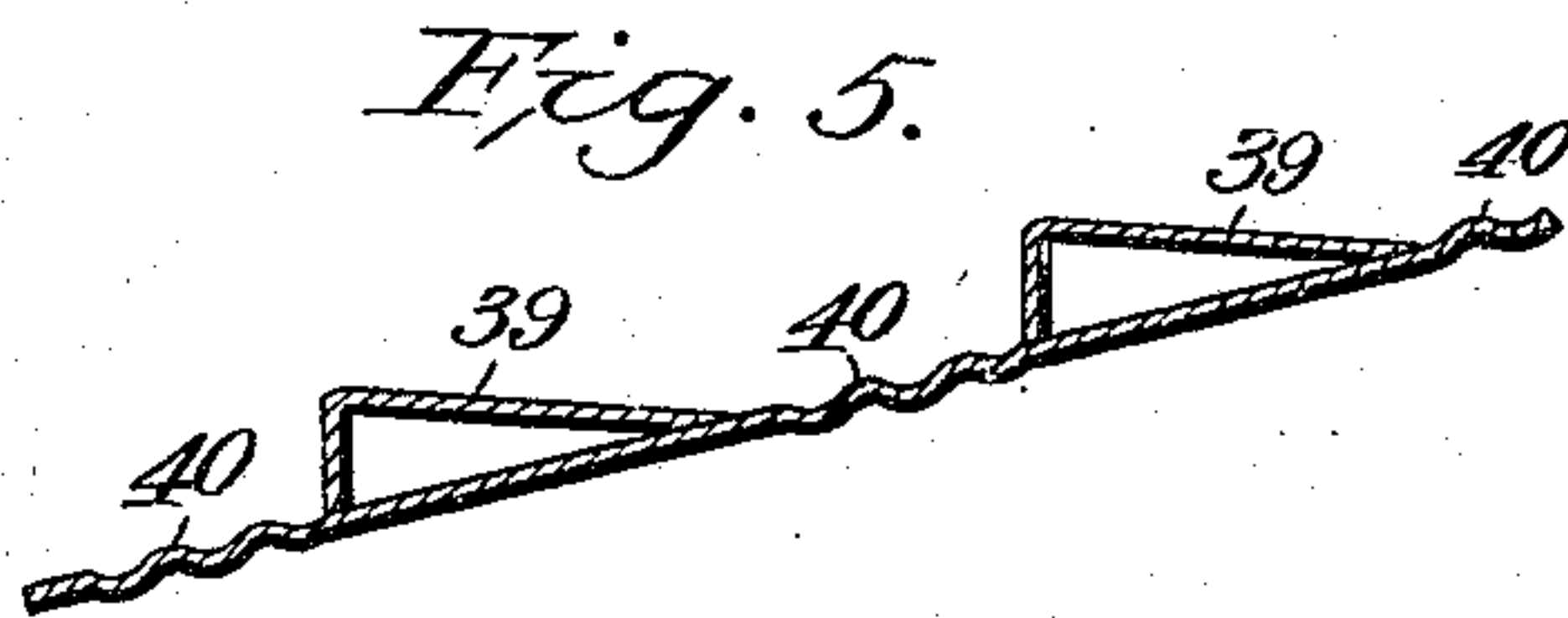


Fig. 5.

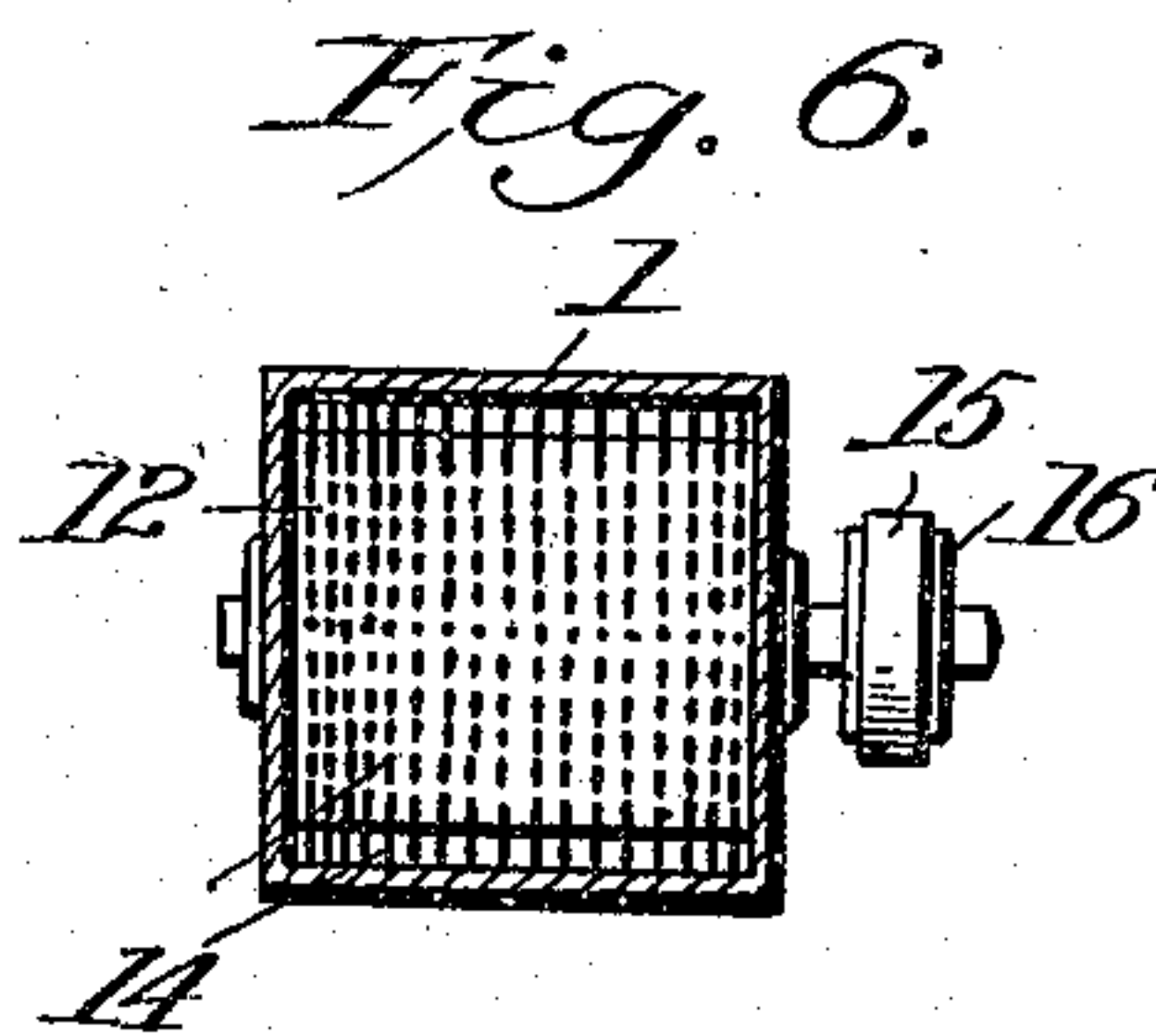


Fig. 6.

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# UNITED STATES PATENT OFFICE.

JOSEPH ALLISON COOMBES, OF ATLANTIC CITY, NEW JERSEY, ASSIGNOR  
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## APPARATUS FOR EXTRACTING AND SAVING GOLD.

No. 840,752.

Specification of Letters Patent.

Patented Jan. 8, 1907.

Application filed November 10, 1905. Serial No. 286,695.

*To all whom it may concern:*

Be it known that I, JOSEPH ALLISON COOMBES, a subject of the King of Great Britain, and a resident of Atlantic City, county of Atlantic, and State of New Jersey, have invented certain new and useful Improvements in Apparatus for Extracting and Saving Gold, of which the following is a specification.

10 This invention relates to certain new and useful improvements in apparatus for extracting and saving gold from alluvial or placer beds, dirt, sand, and gravel, and pulverized rock.

15 The present invention has for its objects, among others, to provide simple and efficient means whereby the material may be successfully treated in the absence of water or other liquid and yet effect a saving of practically all of the gold in the dirt, &c. The apparatus may be used absolutely without chemicals or with quicksilver or other suitable substance.

25 I provide an adjustable inclined hopper upon which the dirt is deposited, the coarse gangue flowing over from the same into the dump, while the gold-bearing dirt passes through the screen into the upright section of the apparatus, where it is regulated in its flow to the revolving cylinders by means of an adjustable regulator. Beneath the said regulator I dispose one or more revolving cylinders provided with projections, and when more than one cylinder is employed 35 they are connected to revolve in unison. These cylinders may or may not be coated with quicksilver for a purpose which will be readily understood. The upright section connects with a substantially horizontal section, at one end of which is disposed a suction-fan and at the other end a removable box designed to receive the gold, while the gangue or worthless dust is drawn or sucked out at the other end by the suction-fan. The 45 horizontal section may in some instances be provided with riffles or the like, and the revolving cylinders are designed to be revolved by connection with the fan-shaft. The bottom of the horizontal section is in sections, so that either section may be removed for the purpose of cleaning up or other purposes, and the portions between the riffles are corrugated to form receptacles for containing quicksilver when the latter is employed.

Other objects and advantages of the invention will hereinafter appear, and the novel features thereof will be specifically defined by the appended claims.

The invention in its preferred form is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a substantially central vertical section through my improved apparatus. 55 Fig. 2 is a rear elevation thereof. Fig. 3 is an enlarged sectional detail, with a portion in elevation, of the adjustably-inclined hopper. Fig. 4 is an enlarged detail, in side elevation, of the lower or horizontal section 65 of the apparatus. Fig. 5 is an enlarged section of one of the sections of the bottom of the horizontal portion of the apparatus. Fig. 6 is a cross-section on the line 6 6 of Fig. 1 looking down.

75 Like numerals of reference indicate like parts throughout the several views in which they appear.

Referring now to the details of the drawings, 1 designates a casing substantially upright and of any suitable material of proper height and dimensions, having, preferably, one side made removable, as by the screws 2 or analogous means, so as to permit access to the cylinders when necessary. At the upper 85 end of this casing is a receiving-hopper 3, which has a reticulated bottom 4, and this hopper is designed to be sustained in an inclined position, which inclination, however, is adjustable at will in accordance with the character of the material being treated, and this inclined hopper dispenses with the employment of any grizzly or shaker heretofore employed to prevent clogging of the screen. This hopper may be made adjustable in any 95 suitable manner. In the present instance I have shown a convenient way, which comprises the ratchet or rack bars 5, secured to the outer wall of the casing, and the end of the hopper is provided with a cross-bar 6, 100 which stands off from the end of the hopper, as seen best in Fig. 3, a sufficient distance to allow of its being engaged in any one of the notches of the rack-bars to change the inclination of the hopper. The hopper is shown as 105 provided with vertical grooves 7 in the inner surfaces of its side walls, into which grooves are designed to be removably engaged the



riffles 8, which latter may or may not be employed, as may be found most expedient. If it is found that the material being treated is of such a nature that the heavy gangue does not readily flow over the hopper into the dump, the inclination of the hopper is changed till the heavy gangue flows over as it should do in order to obtain the best results.

Within the casing 1, beneath the hopper, is a pivoted regulator 9, which is provided with a projecting pintle 10, provided with a handle 11, by which the position of the regulator may be readily changed to vary the flow of the material to the cylinders arranged therebeneath. This regulator is preferably inclined, as shown, to facilitate the flow of the material as it comes from the hopper. This regulator also regulates the air-draft.

Within the casing 1 I arrange one or more cylinders, in this case two—12 and 13—being shown. Each is provided about its periphery with a plurality of projections or pins 14, and the size of the cylinders is such as to leave a space between their peripheries and the walls of the casing; but the projections come practically close to the said walls, as shown. These cylinders, with their projections, serve to disintegrate any material that may, perchance, become caked by reason of its being moist or for any other cause requiring to be broken up. The spaces between the projections, as well as the projections themselves, may be dressed with mercury when desired for the purpose of amalgamating and saving the very fine gold-dust.

The cylinders 12 and 13 are designed to be revolved, in this instance by the belt 15, passed around pulleys 16 and 17 on the shafts of said cylinders, as seen clearly in Figs. 1 and 2, and the shaft 18 of the lower cylinder is extended and has a bearing in a bracket 19, secured to the outer wall of the casing, as seen in Fig. 2, and on this extended end of this shaft is a pulley 20, which receives a belt 21, which passes over a pulley 22 on the shaft 23 of the suction-fan, and on this latter shaft is a pulley 24, to which motion is imparted by a belt 25, (seen in Fig. 1,) and deriving its power from any suitable source. (Not shown.) By this means the cylinders 12 and 13 are revolved from the fan-shaft.

26 is the horizontal or lower portion of the apparatus. It comprises a casing, which may be more or less inclined, as seen in Fig. 1. It is closed at its rear end, as seen at 27, and at a point near said closed end there is the side outlet 28 into the fan-casing 29. The fan 30 may be of any of the well-known forms of suction-fans suited to the purpose and is carried by the shaft 23, as seen in Fig. 1.

31 is the outlet from the fan-casing.

The horizontal portion 26 of the apparatus may be of any required length, and its front end is designed to receive the removable box

into which the gold is received as it comes down the upright casing 1. This box 32 is made removable and insertible at the front end of the horizontal portion 26 and extends about two-thirds of its length within the said horizontal portion of the apparatus, as seen in Fig. 1. It has a perforated top 33, as seen in Fig. 1, and it slides in upon the bottom of the horizontal section, as seen in said Fig. 1. In this instance it is shown as provided at its inner end with a turned-up portion 34, which may serve as a riffle. It may be provided with a suitable handle 35, as seen in Fig. 1, by which it may be manipulated.

The bottom of the horizontal section is made in sections separately supported, so that any section may be removed for cleaning up or repairs. These sections 36 are held in their normal position by suitable means, as the hooks 37, engaging the pins or the like 38, as seen in Fig. 4. These bottom sections are provided with the riffles 39, as seen best in the enlarged section, Fig. 5, and the portions of the bottoms between these riffles are corrugated, as seen at 40, to form receptacles for mercury when the same is employed.

The bottom of the hopper is made removable, being slidable in suitable guide-grooves 41, as seen in Fig. 3, so that a bottom of any desired mesh of screen may be readily inserted, according to the wishes of the operator or the character of the material being treated.

The operation is as follows: The parts being arranged substantially as shown and above described the material to be treated is deposited upon the hopper, which is adjusted to the proper inclination, according to the character of the material, and the coarse gangue flows over the lower end thereof and onto the dump. The finer portions and the gold pass through the screen and upon the regulator 9, which is also properly adjusted, and from thence the material flows upon the upper revolving cylinder 12 and from thence upon the lower revolving cylinder 13 and then into the box 32. When the cylinders are dressed with mercury, the fine particles of gold-dust will be collected thereupon. The suction-fan is operated during the operation of the apparatus and creates a suction, which may be regulated by the adjustment of the regulator 9, and the worthless dust, &c., is sucked or drawn out through the rear end of the horizontal portion of the apparatus. What particles there may be of gold that does not deposit in the box 32 is caught by the riffles and by the mercury in the corrugated portions 40 of the bottom of the horizontal section. The suction is so adjusted that none of the lighter gangue reaches the box 32, it being drawn out through the horizontal portion and out at the discharge-outlet of the fan. The riffles in the bottom of



the hopper serve to catch the nuggets of gold which may be picked therefrom by hand.

It is evident that the method may be carried out by other means than that described, and it is also evident that variations, modifications, and changes may be made without departing from the spirit of the invention or sacrificing any of its advantages. I therefore do not wish to be restricted to the details of construction herein disclosed, but reserve the right to make such changes, variations, and modifications as come properly within the scope of the protection prayed.

What is claimed as new is—

1. In a gold-saving apparatus, a vertical casing, an inclined hopper adjustably and removably mounted at the upper end of said casing, a pivotally-mounted inclined regulator within said casing beneath said hopper, a pair of cylinders mounted to revolve in unison within said casing beneath said regulator, and means for revolving said cylinders.

2. In a gold-saving apparatus, a vertical casing, an inclined hopper adjustably and removably mounted at the upper end of said casing, a pivotally-mounted inclined regulator within said casing beneath said hopper, a pair of cylinders mounted to revolve in unison within said casing beneath said regulator, means for revolving said cylinders, a horizontally-inclined casing communicating with the lower end of the vertical casing, a suction-fan located at one end of said horizontal casing, and a receptacle removably inserted in the other end beneath said cylinders.

3. In a gold-saving apparatus, a vertical casing, an inclined hopper adjustably and removably mounted at the upper end of said casing, a pivotally-mounted inclined regulator within said casing beneath said hopper, a pair of cylinders mounted to revolve in unison within said casing beneath said regulator, means for revolving said cylinders, a horizontally-inclined casing communicating with the lower end of the vertical casing, a suction-fan located at one end of said horizontal casing, and a receptacle removably inserted in the other end beneath said cylinders, the bottom of the horizontal casing between the fan and the receptacle being provided with riffles.

4. In a gold-saving apparatus, a vertical casing, an inclined hopper adjustably mounted at the upper end of said casing, a pivotally-mounted inclined regulator within said casing beneath said hopper, a pair of cylinders mounted to revolve in unison within said casing beneath said regulator, means for positively revolving said cylinders, a hori-

zontally-disposed casing communicating with the lower end of the vertical casing, and a suction-fan located at the end of the horizontal casing farthest from the vertical casing.

5. In a gold-saving apparatus, a vertical casing, an inclined hopper adjustably mounted at the upper end of said casing, a pivotally-mounted inclined regulator within said casing beneath said hopper, a pair of cylinders mounted to revolve in unison within said casing beneath said regulator, means for positively revolving said cylinders, a horizontally-disposed casing communicating with the lower end of the vertical casing, and a suction-fan located at the end of the horizontal casing farthest from the vertical casing, said cylinders being provided with projections upon their peripheries.

6. In a gold-saving apparatus, a casing, an inclined hopper at the upper end thereof, a pivotally-mounted regulator in said casing beneath said hopper, cylinders disposed one above the other in said casing beneath the regulator and having rigid projections on their peripheries, a horizontal portion in communication with said casing, and a suction-fan at the rear end of said horizontal portion.

7. In a gold-saving apparatus, a casing having a hopper at its upper end, cylinders in said casing, one above the other and having rigid points on their peripheries, a horizontal portion with a suction-fan at its rear end, and riffles at the bottom of the horizontal portion.

8. In a gold-saving apparatus, a vertical casing, a horizontal portion in communication therewith, a suction-fan at one end of the horizontal portion, and a removable box at the other end and cylinders revoluble in the vertical casing above said box, said cylinders being disposed one above the other and positively driven.

9. In a gold-saving apparatus, a vertical casing, a substantially horizontal portion in communication therewith and having a bottom with alternately-disposed riffles and corrugations, a suction-fan at one end of the horizontal portion, a gold-collecting receptacle at the other end having a portion with a perforated top, and a cylinder revoluble in the vertical casing above said receptacle.

Signed by me at Washington city, District of Columbia, this 9th day of November, 1905.

JOSEPH ALLISON COOMBES.

Witnesses:

M. A. BOND,

FRANK A. HARRISON.