

No. 685,773.

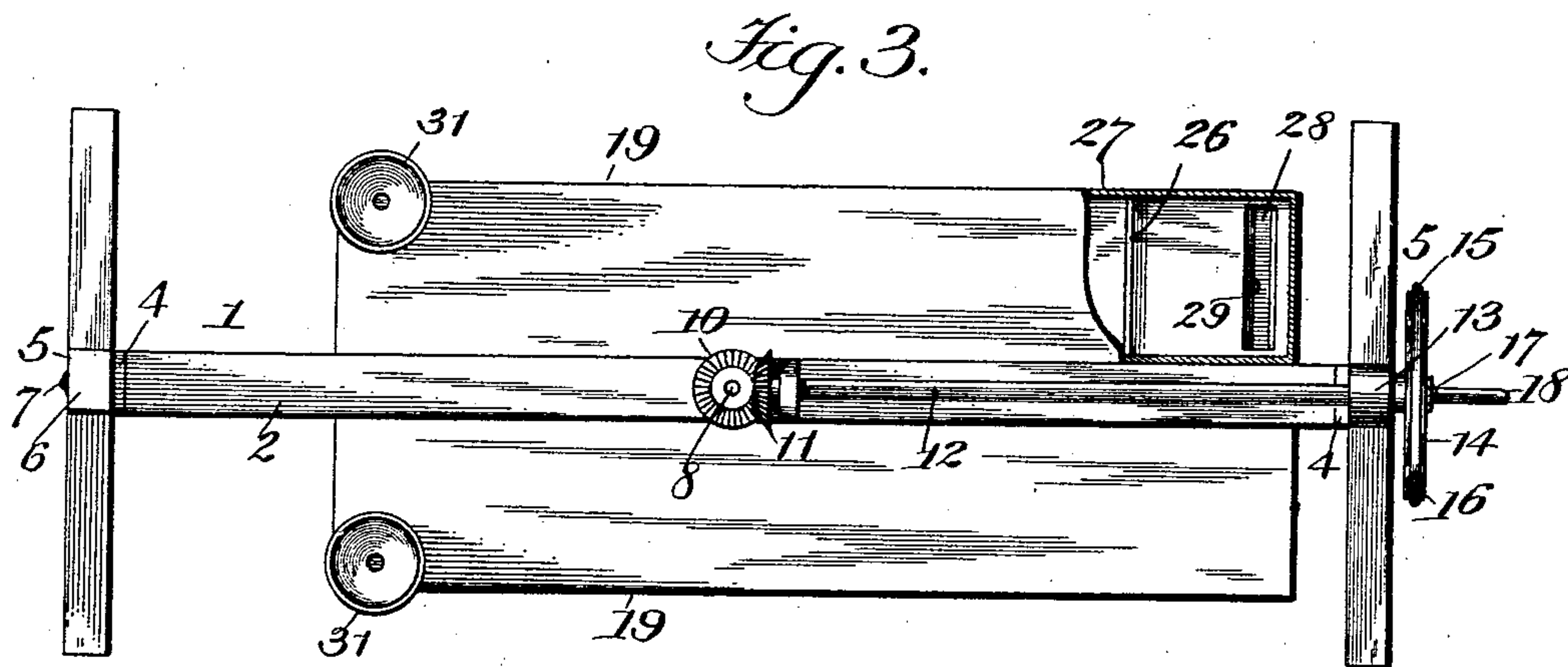
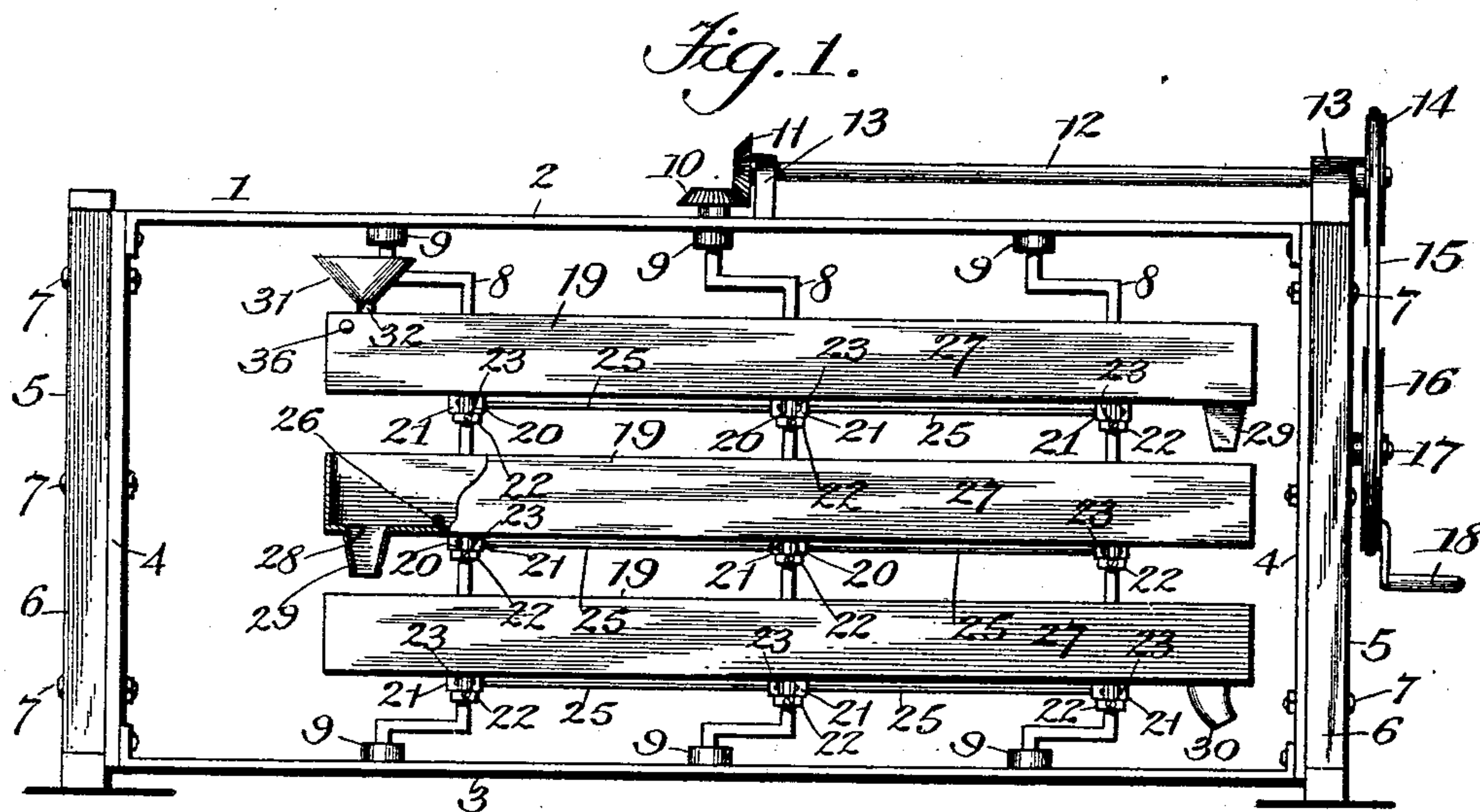
Patented Nov. 5, 1901.

J. N. LEWIS.  
SEPARATOR FOR PLACER MINING.

(Application filed Sept. 14, 1900.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:  
A. R. Appleman  
M. C. Matthes

Inventor  
James N. Lewis,  
By his Attorney  
J. R. Littell

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Fig. 2.

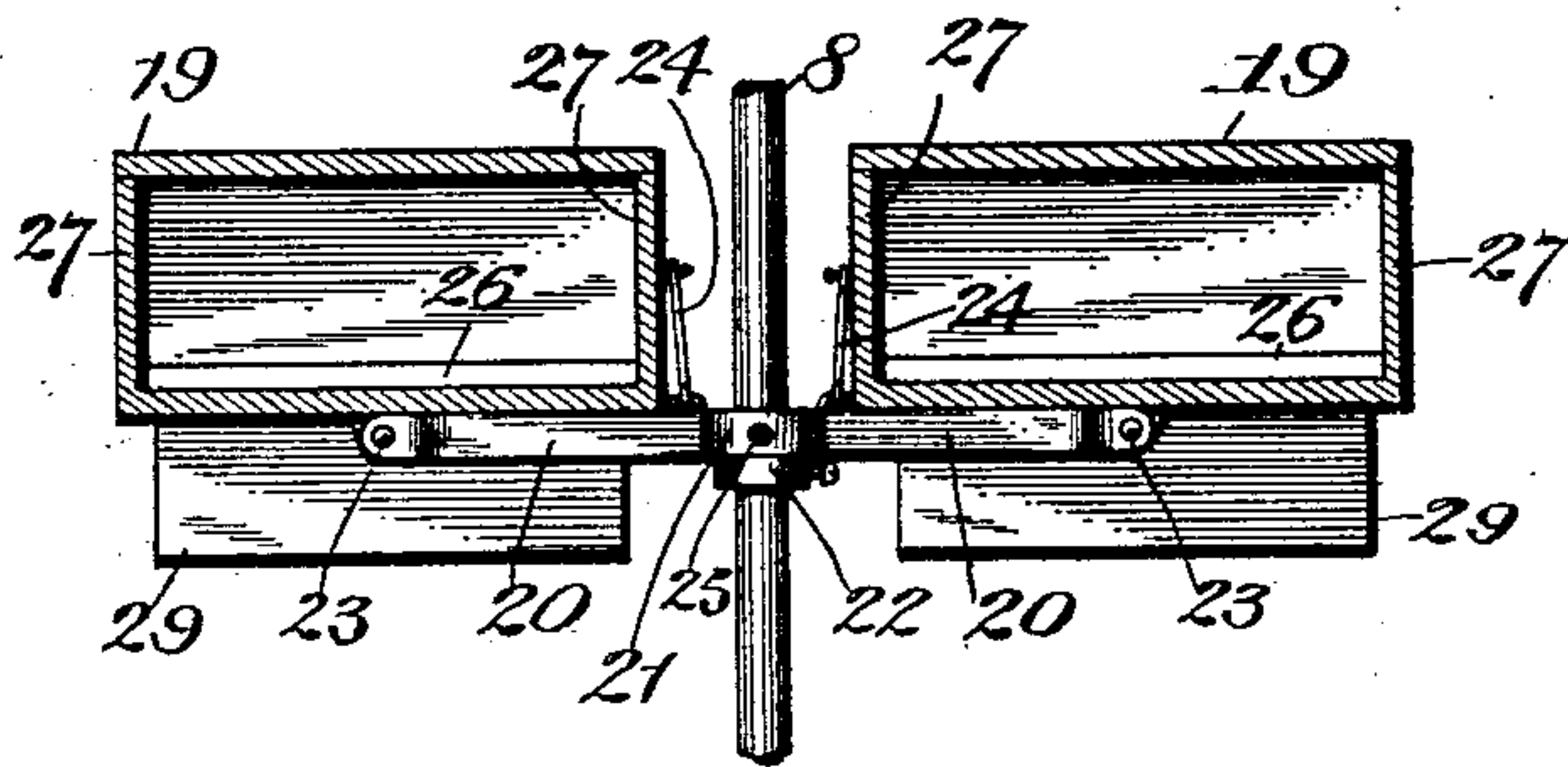
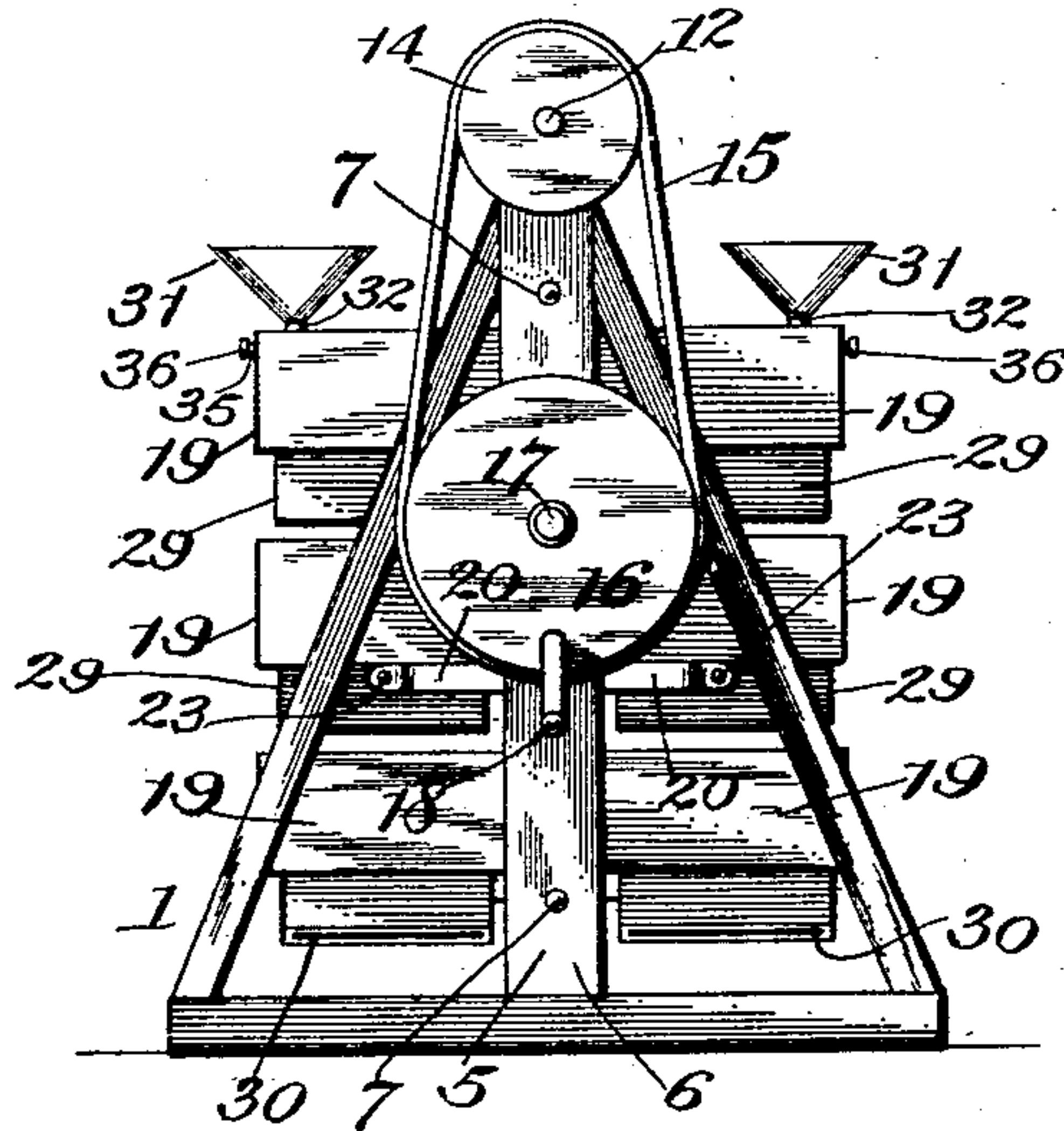


Fig. 4.

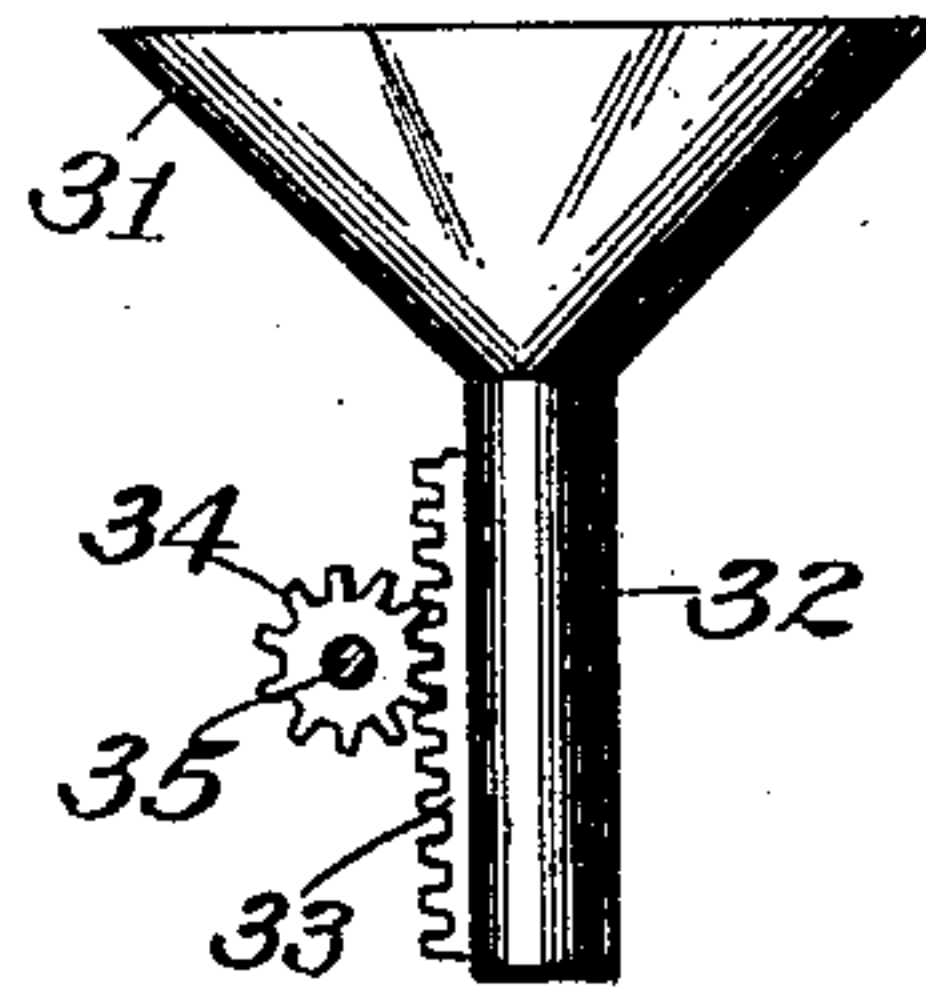


Fig. 5.

Witnesses:  
A. R. Appleman  
M. C. Matthes

By

James N. Lewis, Inventor  
J. R. Littell, Attorney



# UNITED STATES PATENT OFFICE.

JAMES N. LEWIS, OF ANN ARBOR, MICHIGAN.

## SEPARATOR FOR PLACER-MINING.

SPECIFICATION forming part of Letters Patent No. 685,773, dated November 5, 1901.

Application filed September 14, 1900. Serial No. 29,997. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES NELSON LEWIS, a citizen of the United States, residing at Ann Arbor, in the county of Washtenaw and State of Michigan, have invented certain new and useful Improvements in Separators for Placer-Mining, of which the following is a specification.

This invention relates to separators for placer-mining; and it has for its object to provide a simple and improved device or apparatus of this character which will operate with maximum efficiency and have a large capacity and which will be furthermore advantageous in point of convenience, inexpensiveness, economy, effectiveness, and general efficiency.

In the drawings, Figure 1 is a side view, partly in section, showing an apparatus embodying my improvements. Fig. 2 is an end elevation of the same. Fig. 3 is a top or plan view, partly in section. Fig. 4 is a detail vertical sectional view taken transversely through the sluice-boxes. Fig. 5 is a detail sectional view illustrating the arrangement and operation of the feed-hopper.

Corresponding parts in all the figures are denoted by the same numerals of reference.

Referring to the drawings, 1 designates a suitable framework, which may be in the main of any suitable or adapted construction and which preferably comprises longitudinal top and bottom bars or beams 2 and 3, respectively, and end beams or uprights 4, connecting the same. The framework just described is preferably formed of bar steel or metal suitably bolted or connected together, and at each end said framework is connected to a suitable supporting-framework 5, adapted to sustain the apparatus in operative position and preferably embodying uprights or beams 6, to which the metallic framework is bolted, as at 7, or otherwise connected.

Within the framework 1 is arranged a series of vertical crank-shafts 8, preferably three in number, so that one forms a central crank-shaft, while the others form end crank-shafts. Said crank-shafts may operate in any suitable or adapted ball-bearing devices 9, carried by the top and bottom frame-bars 2 and 3 and constituting the upper and lower bearings for the crank-shafts. One of said crank-

shafts, preferably the central one, carries at its upper end a bevel-gear 10, which meshes with a bevel-gear 11, carried upon a shaft 12, 55 extending in a longitudinal plane with respect to the main framework 1 and 6 and mounted in suitable bearings, as at 13, upon said framework. If desired, the shaft 12 may extend longitudinally of the apparatus and 60 be provided with a plurality of bevel-gears 11, meshing with corresponding bevel-gears upon each of the crank-shafts 8. It will be understood that the crank-shafts are revolved in unison by operation of the shaft 12, and 65 the latter may be operated in any suitable or desired manner—for instance, by means of a pulley or sprocket-wheel 14, carried at one end of the shaft 12 and connected by a belt or chain 15 with a pulley or sprocket-wheel 16, mounted upon one of the end mem- 70 bers 6 of the main framework, as at 17, and having an operating-crank 18.

The shaft 12 may of course be operated by any suitable power applied directly to the 75 band wheel or pulley upon the same or in any other suitable or adapted manner, or the connection between the shaft 12 and the vertical crank-shafts may be formed in any suitable or adapted manner, or said crank-shafts may 80 be otherwise operated in unison by means of any suitable connecting or operating mechanism. For instance, a drive-wheel or pulley may be directly applied to the central crank-shaft 8 and operated by any suitable power. 85

The crank-shafts 8 carry the sluices or concentrating-boxes, as at 19, which are arranged in a superimposed independent series at opposite sides of the series of crank-shafts. Said sluice-boxes extend in longitudinal po- 90 sition with respect to the series of crank-shafts and are designed to maintain a horizontal position during their operation. They are preferably carried upon transverse arms 20, providing a bearing, as at 21, upon the 95 crank-shafts, and preferably sustained in position by means of an adjustable supporting-collar, as at 22. The respective sluice-boxes 19 are pivotally mounted on their central plane, as at 23, upon the outer ends of the 100 transverse arms 20, which are carried by the crank-shafts, and said arms may also carry a hook, as at 24, or other suitable device adapted to engage the inner side portion of



the sluice-boxes 19 inside their pivotal connection 23 and maintain the sluice-boxes in horizontal position during operation. The pivotal mounting of the sluice-boxes and the fastening connection 24 are designed to enable the sluice-boxes to be turned over upon their pivots for cleansing or emptying or similar purposes, as desired.

To enable the operation of the crank-shafts in a corresponding unison movement, especially in cases where the power is applied to only the central crank-shaft, they are connected in series, preferably by means of connecting-rods, as at 25, extending in a longitudinal plane between the transverse arms 20, which support and carry the sluice-boxes, and said rods also operate to maintain the transverse arms in normal operative position during the movement of the crank-shafts.

The sluice-boxes are arranged in independent superimposed series at the respective sides of the set of crank-shafts, and each of said side series is provided with independent feed and outlet means. All the sluice-boxes are, as above stated, designed to uniformly maintain a horizontal position during operation, and this position is assured by the arrangement of the apparatus in the manner herein shown and described. Each sluice-box is provided with a series of transverse parallel rifles, as at 26, which have a less vertical projection than the sides 27 of the sluices.

The respective independent sets of sluice-boxes at the different sides of the series of crank-shafts are designed to form, collectively, a continuous sluice, in which the line of travel will be forward through one of the sluice-boxes 19, rearwardly or reversely through the next under sluice-box, and then forwardly again through the next under sluice-box, for which purpose the sluice-boxes are arranged to communicate at their reverse ends, as at 28, which connection may be effected by having an outlet or outlet-tube 29 at one end at the topmost sluice-box 19, a similar outlet or outlet-tube 29 at the opposite end of the next lower sluice-box, and a final outlet-tube, as at 30, at the relatively-reversed end of the lowermost sluice-box 19, which final outlet can be arranged to feed into a suitable drawer or other receptacle for the gangue.

I may provide any suitable or desired number of superimposed sluice-boxes for the respective independent side series; but I prefer to employ simply three, as herein shown. A suitable feed-hopper 31 is provided at the initial end of the topmost sluice-box of the respective side series, which hopper has a tubular stem 32, adapted to project within the sluice. The stem of said hopper is preferably provided with a rack or teeth, as at 33, engaged by a pinion 34 on a shaft 35, adapted to be turned by the engagement of the fingers with a suitable head or finger-piece 36, which shaft may have bearings in the sides of the sluice-box. The purpose of

the adjustable mechanism just described is to enable the vertical adjustment of the feed-hopper to regulate the feed or condition of the sand or the horizontal plane of the same in its feed into the sluice-box. It will be understood that any other suitable or adapted adjusting mechanism controlling the vertical position of the feed-hopper device may be employed for the purpose just stated.

The independent side series of reversely-arranged and horizontally supported and maintained continuous sluices which are formed by the respective superimposed sluice-boxes 19 are designed to conjointly and independently operate at the respective sides of the same series of crank-shafts, whereby a double capacity of the apparatus or mechanism is assured.

The operation and advantages of my invention will be readily understood by those skilled in the art to which it appertains. The sluice-boxes are designed to have a reciprocating and parti-rotary movement, causing an oscillating operation in a horizontal plane, which is effected by maintaining the sluice-boxes so that they are carried in a horizontal plane by the vertical crank-shafts, it being understood that the crank-shafts are arranged intermediately between the respective independent side series of sluices and are also relatively mounted, so that they conjointly maintain a corresponding position with relation to their crank movement. Therefore by operation of the crank-shafts the sluice-boxes are oscillated to describe the movements just above stated in a horizontal plane to cause a reverse movement and continuous line of travel of the sand throughout the full extent of the superimposed sluice-boxes which collectively form the continuous independent sluices at the respective sides of the series of crank-shafts, whereby maximum efficiency of operation and a double or large capacity will be attained.

To produce the most effective results in the travel and discharge of the sands from the sluices in relation to the operative movement of the sluice-boxes, as above set forth, the length of the cranks of the carrying-shafts 8 from center to center preferably corresponds to one-half the width of the sluice-space of the sluice-boxes.

It is manifest that in carrying out my invention and improvements modifications and variations may be made in the detail features of construction and arrangement. I therefore reserve the right to all such variation and modification as properly come within the spirit and scope of my invention and the terms of the following claims.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An improved separator of the class described, comprising vertical crank-shafts arranged in a series, transverse arms or brackets loosely mounted thereon, sluice-boxes



having a pivotal or tilting connection with said arms or brackets adapting the sluice-boxes for inversion and arranged in series at opposite sides of said crank-shafts, and  
5 means for normally maintaining said sluice-boxes in horizontal position.

2. An improved separator of the class described, comprising a plurality of sluice-boxes, means for oscillating said sluice-boxes  
10 in a horizontal plane, transverse arms or brackets operatively connected with and supported by said means and constituting supports for said sluice-boxes which latter have

a pivotal or tilting connection with said arms or brackets whereby said sluice-boxes are  
15 adapted for inversion, and means for normally maintaining said sluice-boxes in horizontal position.

In testimony whereof I have signed my name in the presence of the subscribing wit-  
20 nesses.

JAMES N. LEWIS.

Witnesses:

CHARLES A. WREN,  
B. D. HAMMOND.