

No. 815,853.

PATENTED MAR. 20, 1906.

A. S. MITCHELL.
ORE WASHING MACHINE.
APPLICATION FILED NOV. 12, 1904.

3 SHEETS—SHEET 1.

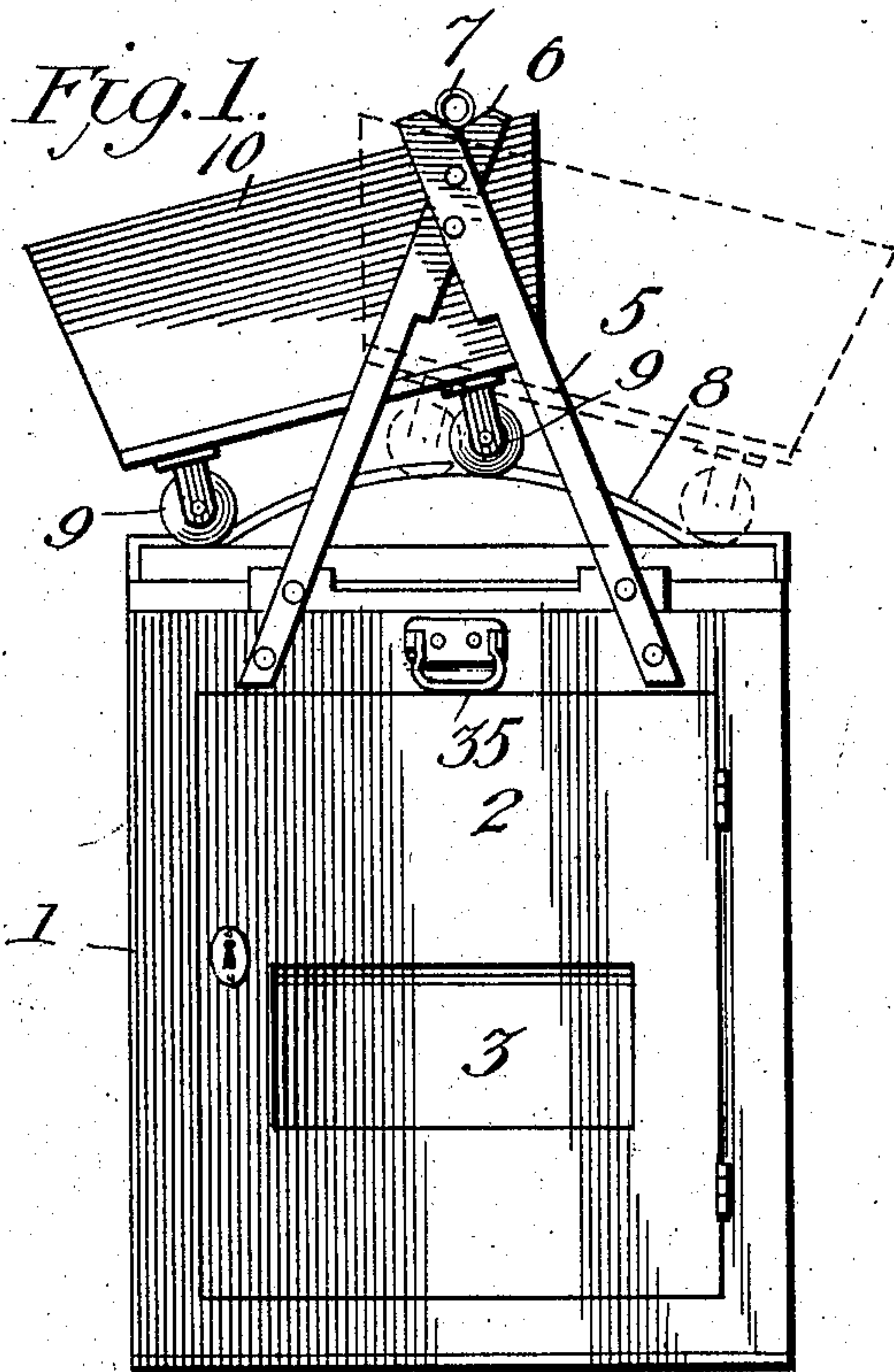
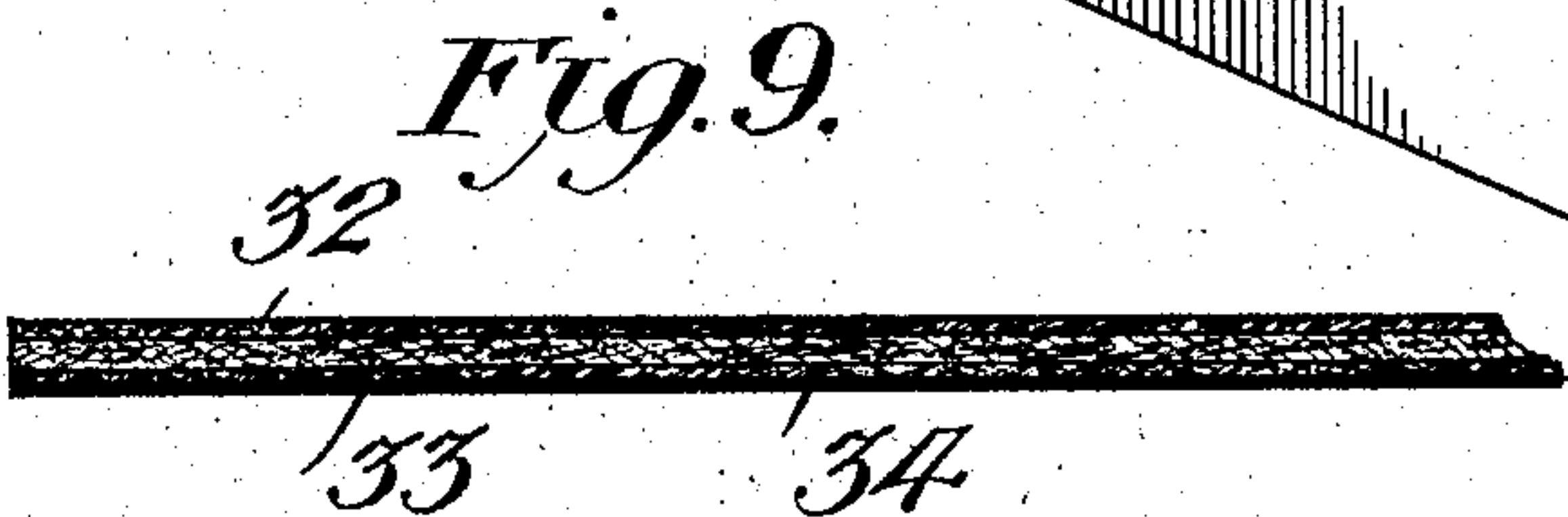
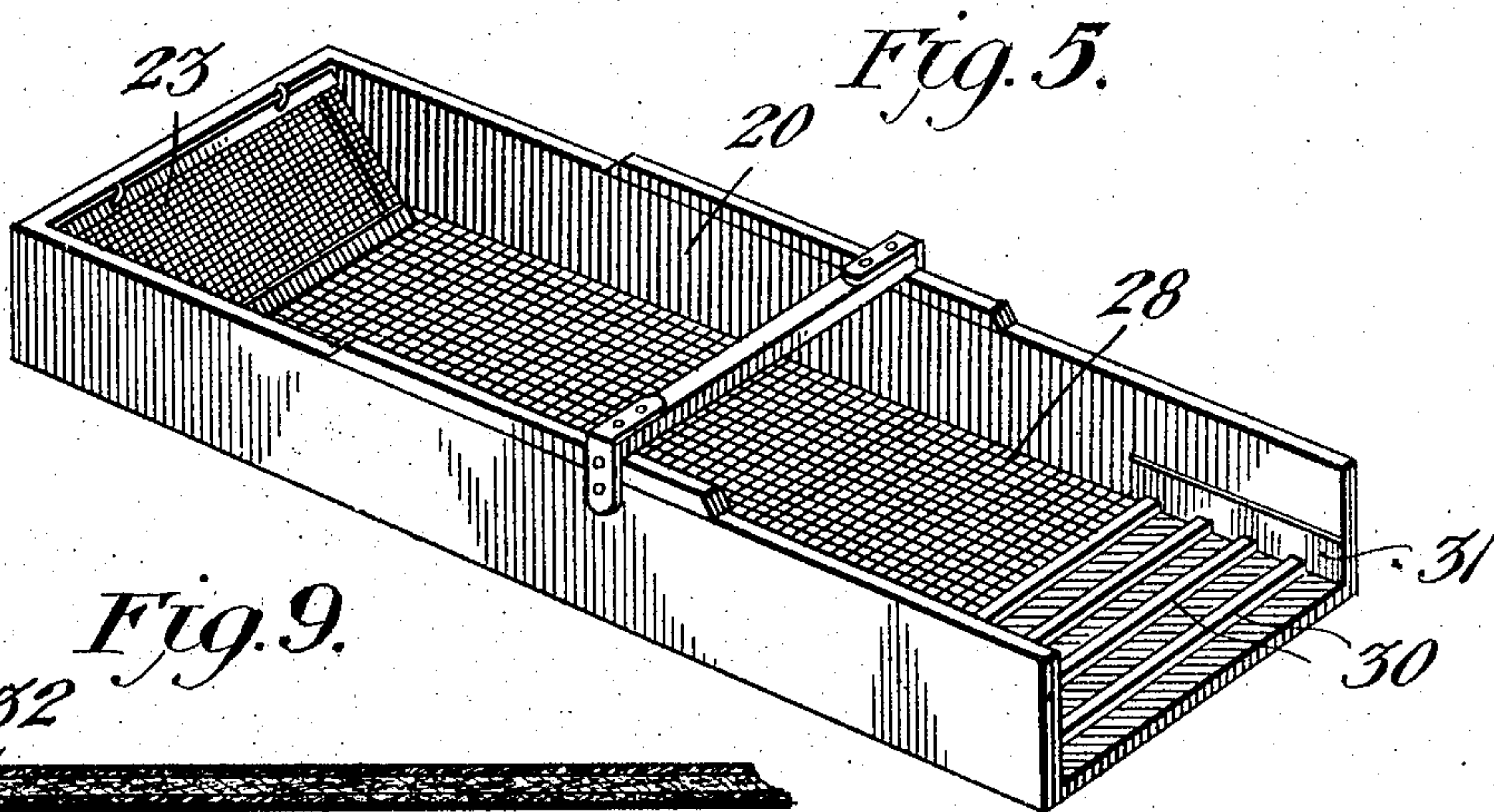
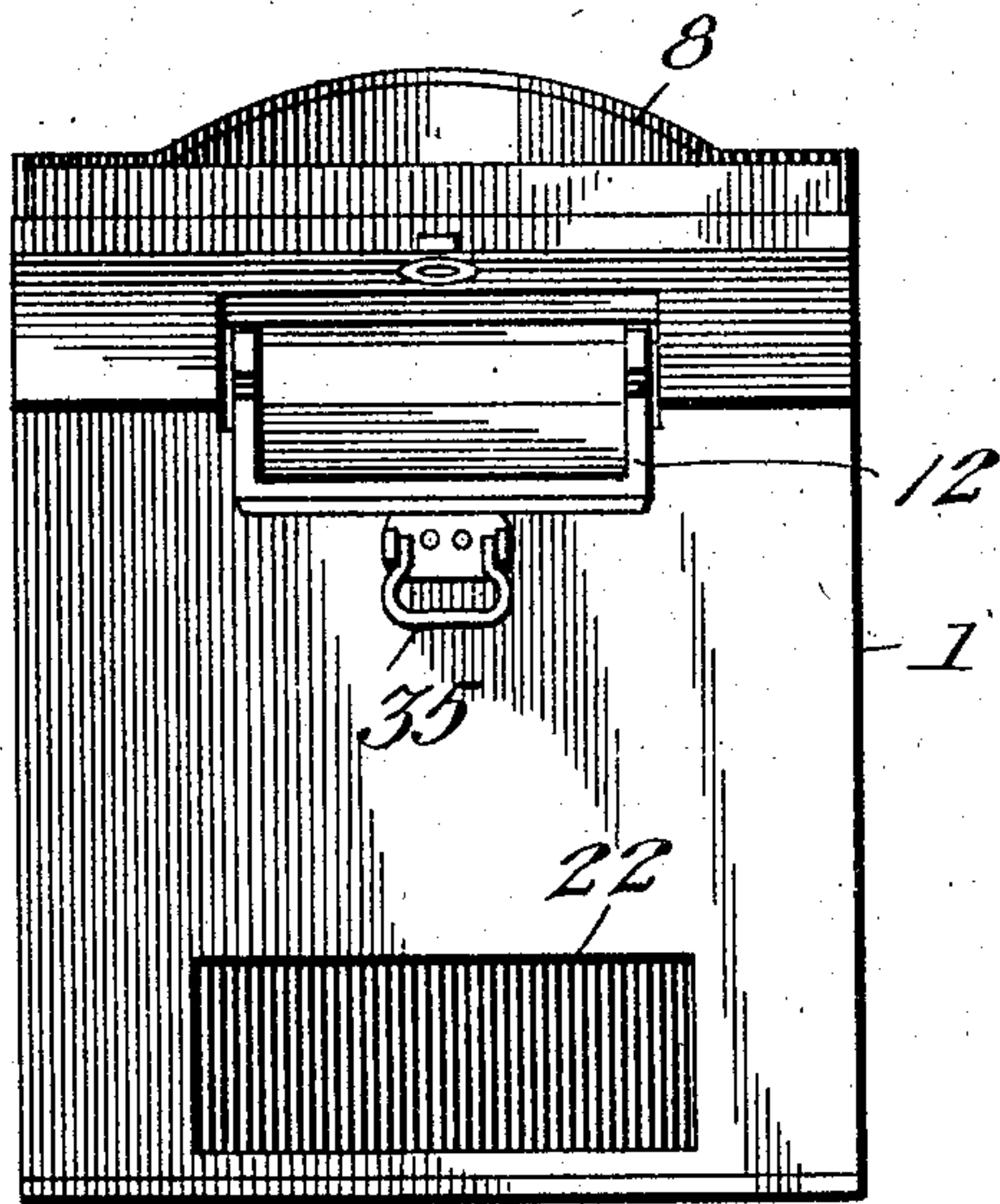


Fig. 2.



Inventor

Alfred S. Mitchell

By

Victor J. Evans

Attorney

Witnesses

Geo. Ackman
A. J. Elmore

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3 SHEETS—SHEET 2.

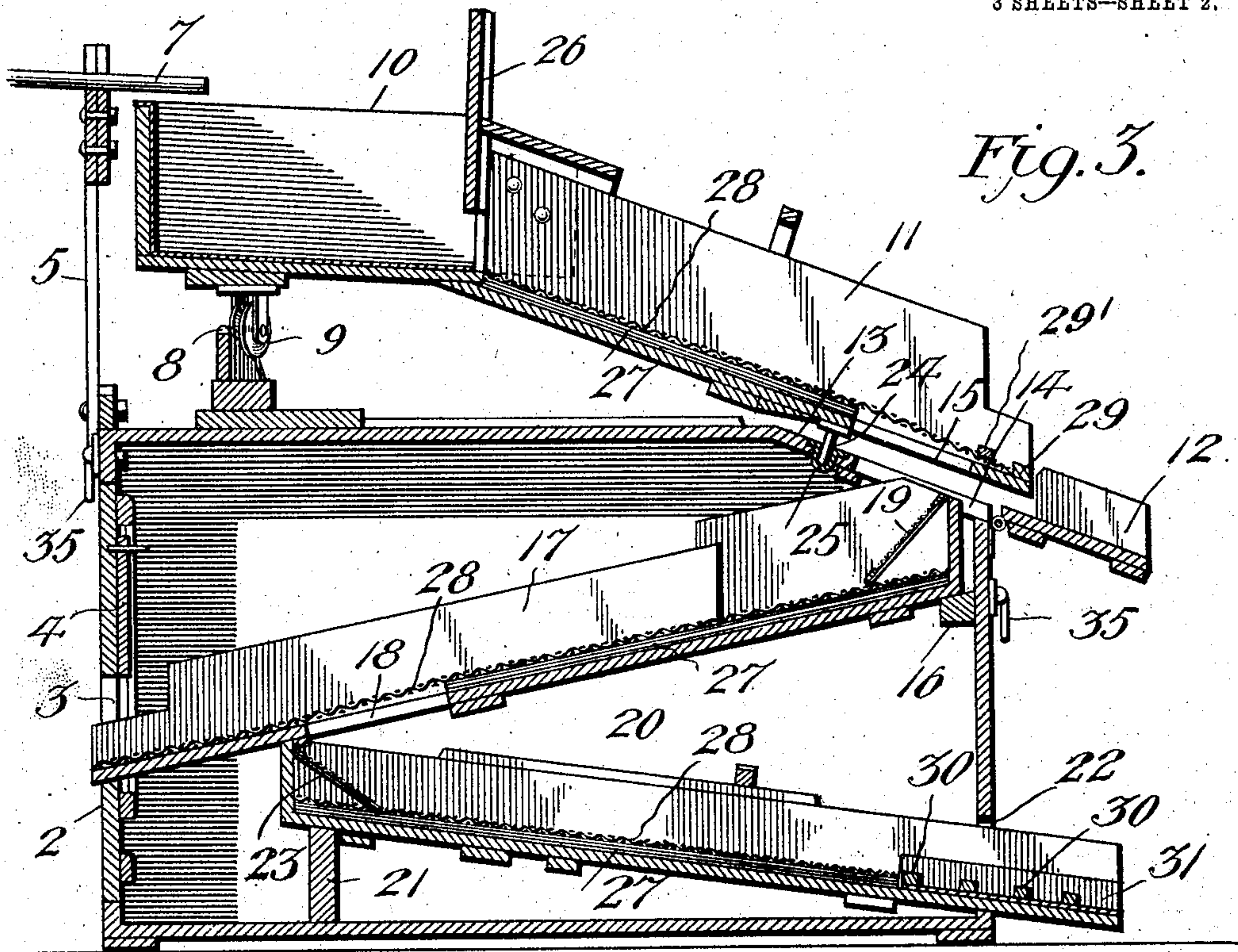
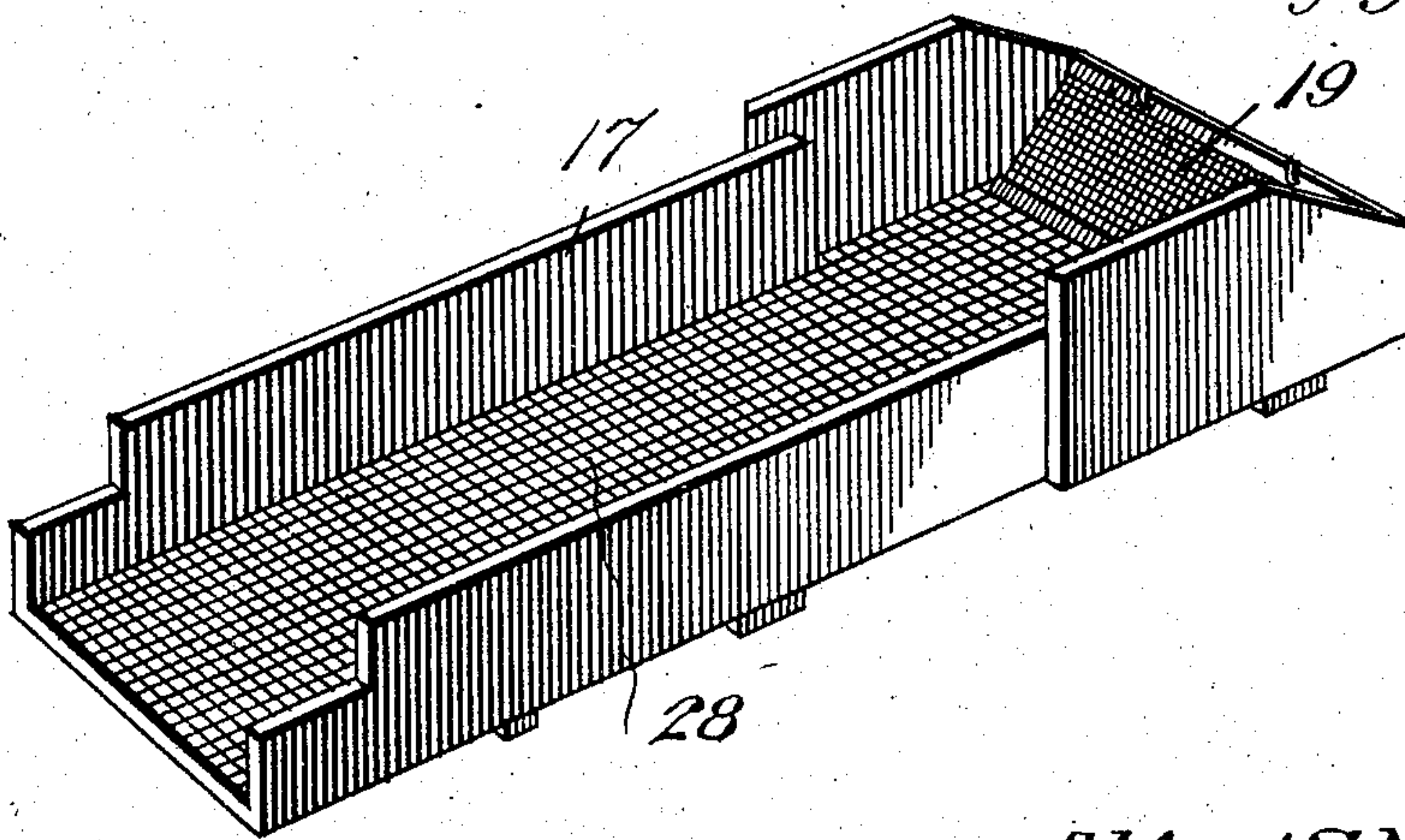


Fig. 6.



Witnesses

Geo. Ackmann
J. J. Elmore

Inventor

Alfred S. Mitchell

By

Victor J. Evans

Attorney

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3 SHEETS—SHEET 3.

Fig. 4.

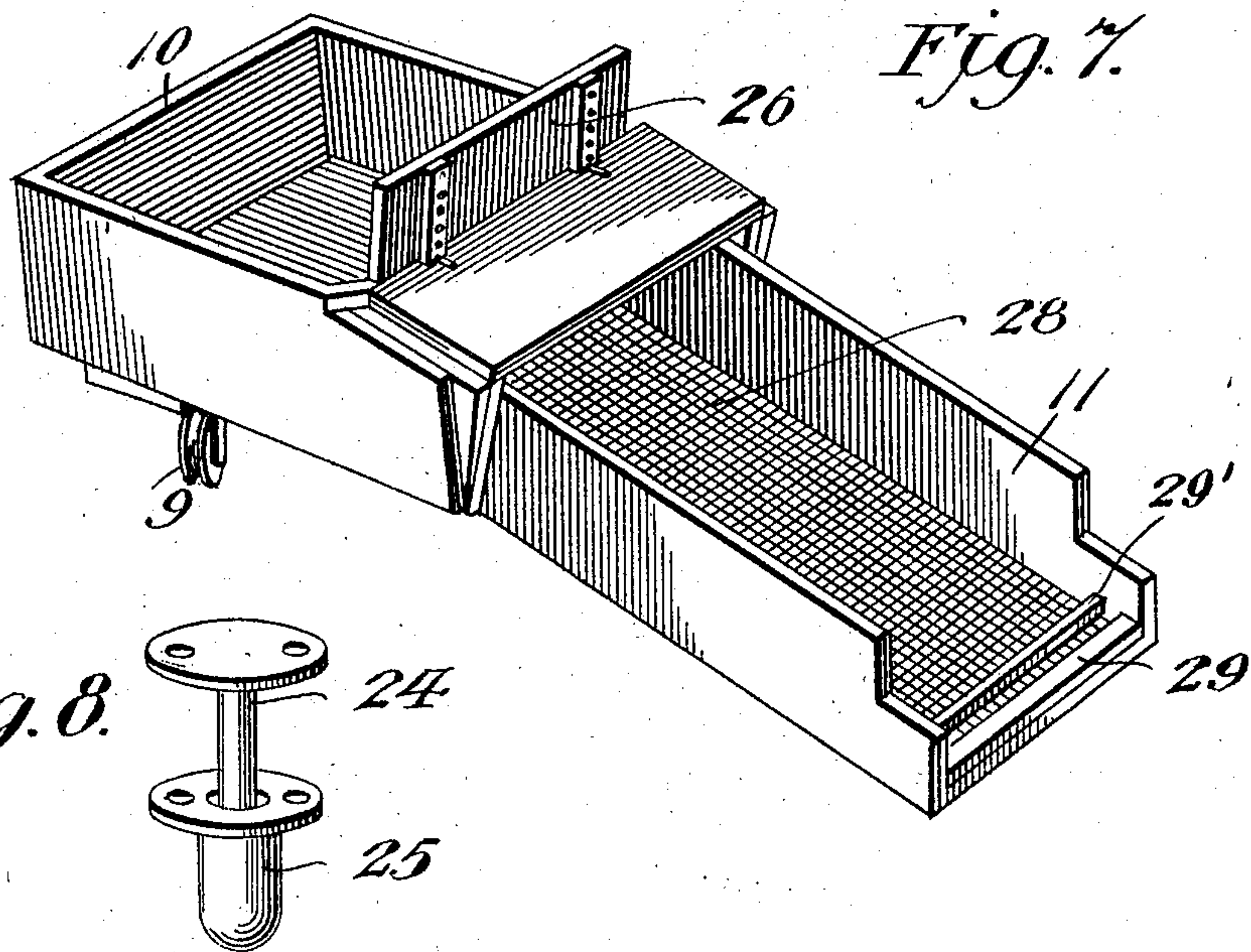
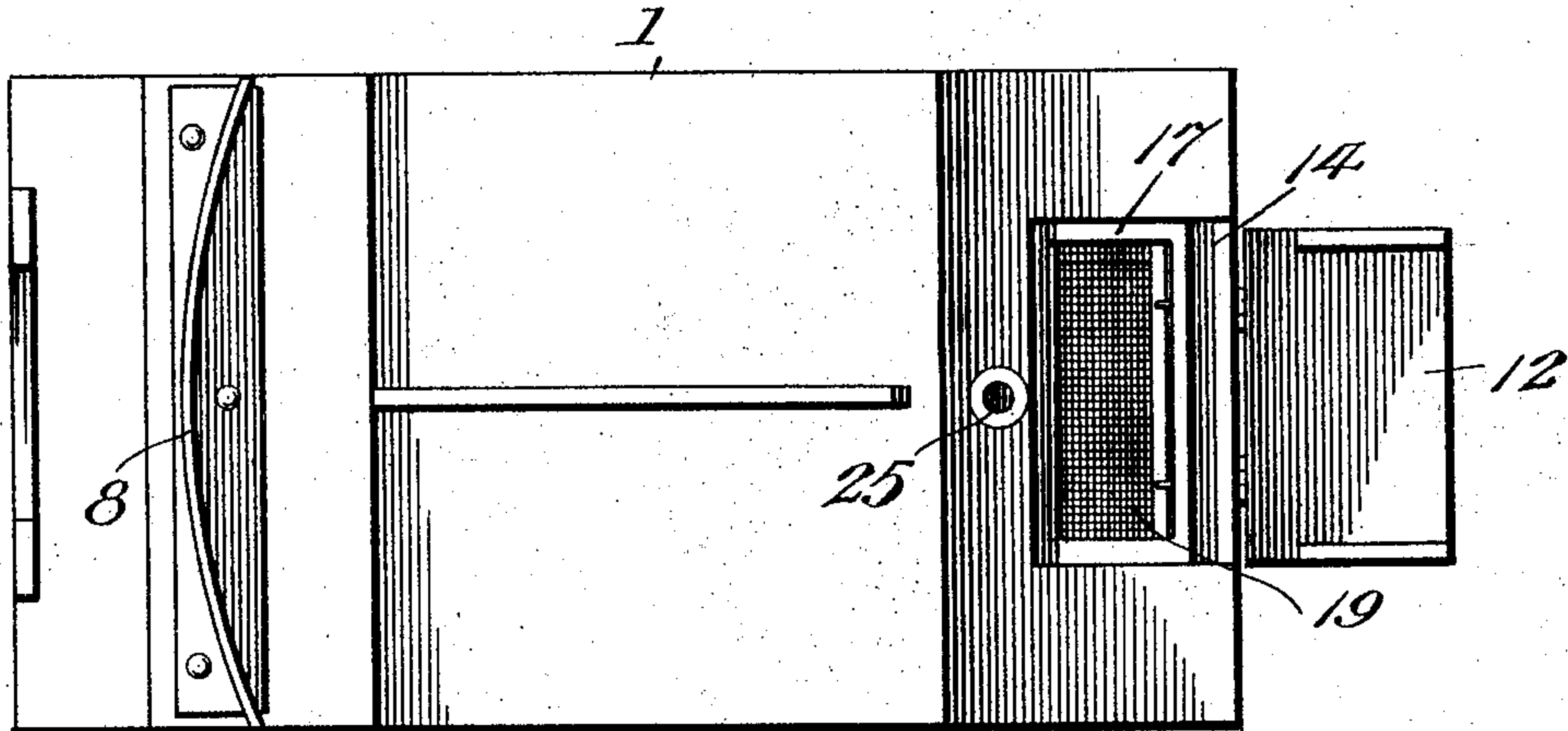
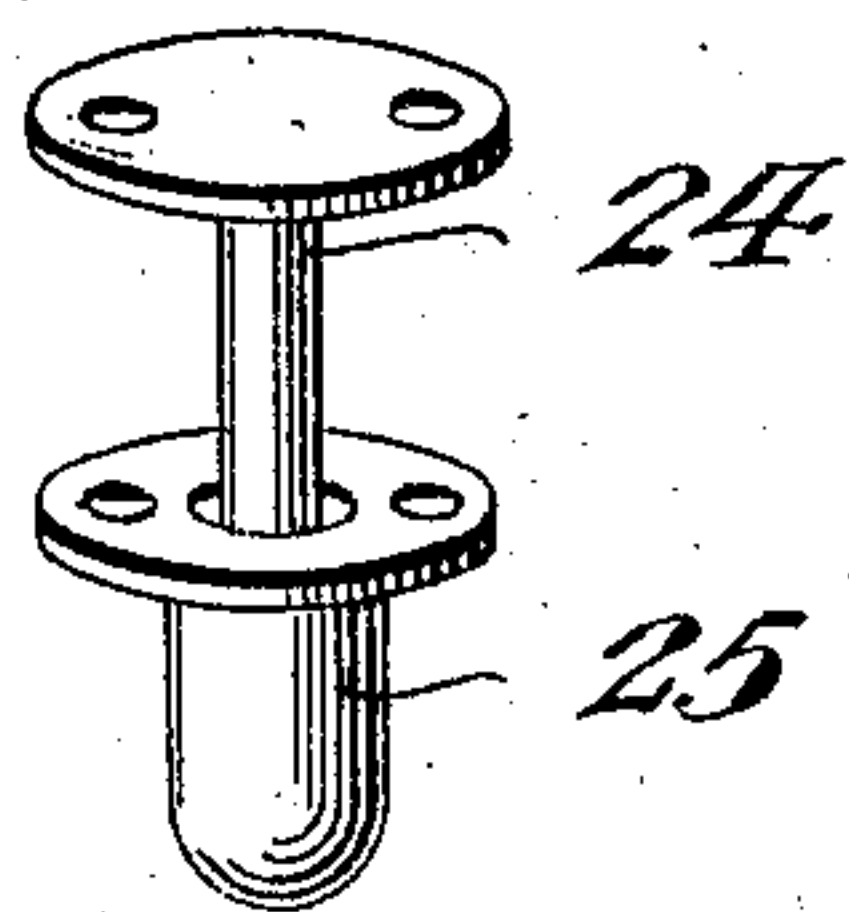


Fig. 8.



Witnesses

Geo. Ackman Jr.
G. J. Elmore

Alfred S. Mitchell,

By *Victor J. Evans*
Attorney

UNITED STATES PATENT OFFICE.

ALFRED S. MITCHELL, OF OAKLAND, CALIFORNIA.

ORE-WASHING MACHINE.

No. 815,853.

Specification of Letters Patent.

Patented March 20, 1906.

Application filed November 12, 1904. Serial No. 232,540.

To all whom it may concern:

Be it known that I, ALFRED S. MITCHELL, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Ore-Washing Machines, of which the following is a specification.

This invention relates to ore-washing machines, and has for its objects to produce a comparatively simple inexpensive device of this character wherein the ore will be thoroughly separated from the gravel, sand, and other gangue and the latter discharged from the machine.

A further object of the invention is to provide an improved rocking member or trough having a gyratory motion and in which the ore is received and initially separated and from which it is delivered onto screens for a final separation, the larger particles of gangue being discharged after the final separation.

A further object of the invention is to provide the ore-receiving screens at their receiving ends with supplemental inclined and finely-perforated screens onto which the ore is delivered from one screen to another and which serves to separate from the mass the finer particles of ore and sand.

A further object of the invention is to provide a screen with an absorbent or filtering material upon which the particles of ore will be deposited and by which they will be retained, the ore so deposited being separated by the filter into strata or layers of varying degrees of quality or specific gravity.

With these and other objects in view the invention comprises the novel features of construction and combination of parts more fully hereinafter described.

In the accompanying drawings, Figure 1 is a rear end elevation of a separator embodying the invention. Fig. 2 is a front end elevation of the same with the screens removed. Fig. 3 is a vertical longitudinal sectional elevation of the complete machine. Fig. 4 is a top plan view of the same. Fig. 5 is a perspective view of the lowermost screen. Fig. 6 is a similar view of the intermediate screen. Fig. 7 is a similar view of the uppermost screen or rocking member. Fig. 8 is a detail perspective view of the pivoting member for the uppermost screen. Fig. 9 is a detail sectional view of a portion of one of the filters.

Referring to the drawings, 1 designates a box or casing provided at its rear end with a door 2, having an opening 3, adapted to be normally closed by a sliding member or closure 4, there being attached to and arising from the rear end of the casing a pair of upwardly-converging crossed members or standards 5, presenting at their upper ends a seat 6 for the reception of a water-delivery pipe or duct 7.

Disposed upon the top and extending transversely of the casing 1 is a longitudinally bowed or curved track or way 8, which receives for travel grooved wheels or rollers 9, journaled in suitable bearings depending from the lower face of a receptacle or hopper 10, which at its forward end merges into and forms a part of an upper downwardly and forwardly inclined ore-receiving chute or trough 11, which terminates at its forward end immediately above a discharge-spout 12, hinged or otherwise pivoted to the forward end of the case, which latter has its top at its forward end downwardly inclined, as at 13, and provided with an opening 14, disposed directly beneath an opening 15 in the bottom of the chute 11.

Attached to the front wall of and within the casing 1 is a transversely-disposed bracket or cleat 16, suitably spaced from the upper end of the casing and constituting a support for the forward end of a rearwardly and downwardly inclined intermediate trough or chute 17, provided in its bottom between its ends with a discharge-opening 18 and having its rear end disposed and supported within the opening 3, there being sustained in the forward end of the chute, which is arranged within the opening 14 and beneath the opening 15, an auxiliary downwardly-inclined screen 19, on which material is delivered through the opening 15 from the chute 11 for a purpose which will hereinafter appear. Beneath the chute 17 is disposed a downwardly and forwardly inclined chute or trough 20, having its rear end disposed beneath the discharge-opening 18 and sustained by a support 21, arising vertically from the bottom of the casing and its forward end projected outward through an opening 22, formed in the front wall of the casing, there being secured at the rear end and within the chute 20 an auxiliary screen 23, disposed beneath the discharge-

opening 18, this screen being downwardly inclined and adapted to receive material discharged through said opening, as in the instance of the screen 19.

5 The uppermost screen 11, which is pivoted adjacent its forward end by means of a depending stud or pintle 24, adapted to step within a seat 25 on the inclined portion 13 of the casing, has arranged between the portions
10 10 and 11 of the trough a vertical slide 26, adapted to close communication between said parts and control the feeding of material from the hopper 10 to the trough 11.

Each of the chutes 11, 17, and 20 has upon
15 its bottom an absorbent or filtering medium 27, over which is applied a sheet of wire fabric or other reticulated material 28, this material being adapted to extend from end to end of the screen and cover the discharge-
20 openings in the chutes 11 and 17 and is of comparatively coarse mesh, the fabric in the screen 11 being secured at the forward end of the latter by a transverse cleat 29, which in
25 practice constitutes a riffle for acting in conjunction with one or more removable metal riffles attached to the screen and of a character to accord with the material under treatment for preventing discharge of any ore which fails to pass through the opening 15,
30 while at the discharge end of the chute 20 there is arranged a plurality of transverse cleats 30, appropriately spaced and constituting riffles to prevent escape of ore from said chute. The cleats 30 serve the further
35 function of retaining in place a copper lining 31, provided at the forward end of the chute 30.

The filtering or absorbent medium 27 consists, as illustrated in Fig. 8, of an upper layer
40 32 of absorbent felt, an intermediate layer 33 of absorbent cotton, and a lower layer 34 of absorbent paper.

In practice the material to be separated is deposited in the hopper 10 and the rocking
45 member, consisting of the hopper and chute 11, has imparted thereto a combined rotary and oscillatory movement by moving the rocking member manually or otherwise back and forth over the track 8, in view of which
50 movement the same rotates upon the pivot 24. While the rocking member is in motion water discharged from the pipe 7 washes the material downward over the screen 28, which serves to retard the ore and permit discharge
55 of the gravel and gangue at the forward end of the chute onto the discharge member 12, by means of which it is directed clear of the underlying discharge end of chute 20. As the material passes the opening 15 the ore
60 and finer particles of gravel and sand escape through the opening 15 onto the screen 19 and downward through the chute 17, whereby a further separation of the material is effected, as just described, owing to the ore being retarded by the wire fabric 28. From the

chute 17 the material escapes through the opening 18 into the chute 20 for further and final separation, the residue of the gravel and gangue being delivered from the discharge
70 end of the chute 20 after the final separation. At the final delivery of the impurities from the chute 20 any ore remaining will be prevented from escaping by the riffles 30. When the material passes from one chute to another,
75 it flows upon the underlying screen 19 or 23, which is composed of finely-perforated wire fabric or other reticulated material, and while the heavier part of the material is deflected and directed downward through the chute by said screen the finer particles of ore
80 and sand pass through the screen onto the fabric 28, by which the fine ore is retained, thus effecting a thorough separation of the finer lighter ore from the heavier ore and its accompanying gangue. As the material and ore
85 are washed through the chutes over the fabric 28 the ore is deposited through the latter onto the absorbent material 27 and quickly percolates through the latter, the heavier ore being retained by the felt 32, the intermedi-
90 ate grade of ore by the cotton 33, and the lighter flour-gold or ore-dust by the paper 34. After the filtering medium has received its full capacity of ore it is removed from the machine and treated for the recovery of said
95 ore, which, as will be readily understood, is graded while being deposited in the filter.

The casing 1 is equipped with handles 35, attached to its opposite ends and by which it may be readily transported from place to
100 place, and when prepared for transportation the various chutes are inclosed within the casing 1 and the opening 14 closed by folding the chute 12 backward thereover, it being ap-
105 parent that said chute thus performs the additional function of a closure for said opening.

From the foregoing it is apparent that I produce a simple inexpensive device in
110 which the ore will be positively and thoroughly separated and graded, one whereby practically no wastage of ore will occur, and one wherein the necessity for burning the framework of the chutes to recover ore there-
115 from, as is now a common practice, is wholly obviated. In attaining these ends it is to be understood that minor changes in the details herein set forth may be resorted to without departing from the spirit or scope of the in-
120 vention.

Having thus fully described the invention, what is claimed as new is—

1. In an ore-separator, an upwardly-curved guideway, a pivoted receiving-trough having wheels arranged for travel on the
125 guideway, a second trough arranged beneath the receiving-trough and adapted to receive material from the latter, a supplemental screen arranged in the second trough and onto which material from the receiving-
130

trough is delivered, and means within the troughs for retarding the passage of material therethrough.

2. In an ore-separator, an upper receiving-trough pivoted for rotation, an upwardly-curved track sustained beneath the receiving end of the trough, wheels carried by the trough for travel on the track, means for delivering water into the trough, means for retarding

the passage of material through the latter, to and an underlying trough to receive material from the receiving-trough.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED S. MITCHELL.

Witnesses:

ORA W. JAYCOX,
DAVID L. JAYCOX.