

(No Model.)

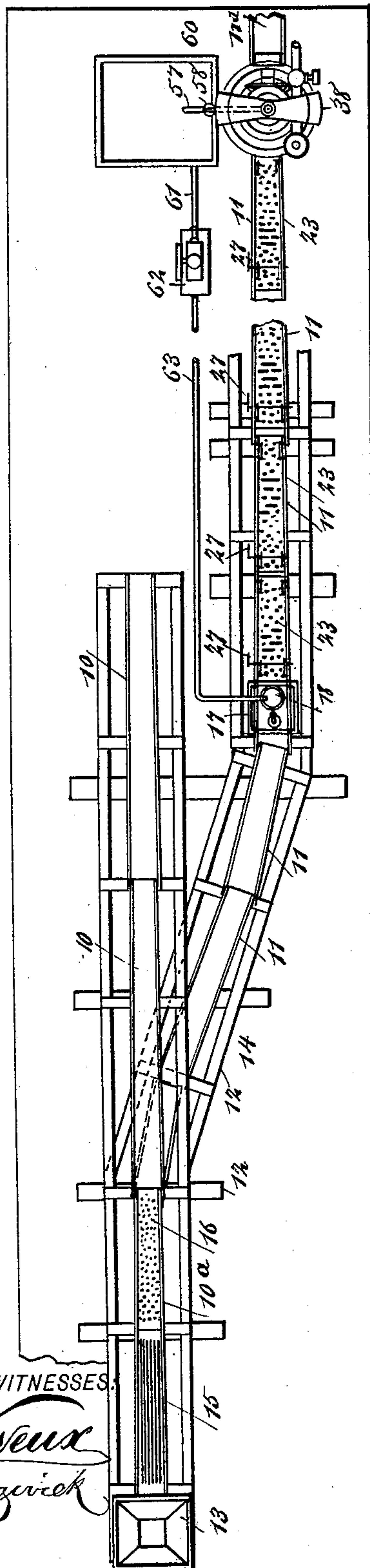
4 Sheets—Sheet 1.

M. D. PLATNER.  
PLACER MINING APPARATUS.

No. 495,832.

Patented Apr. 18, 1893.

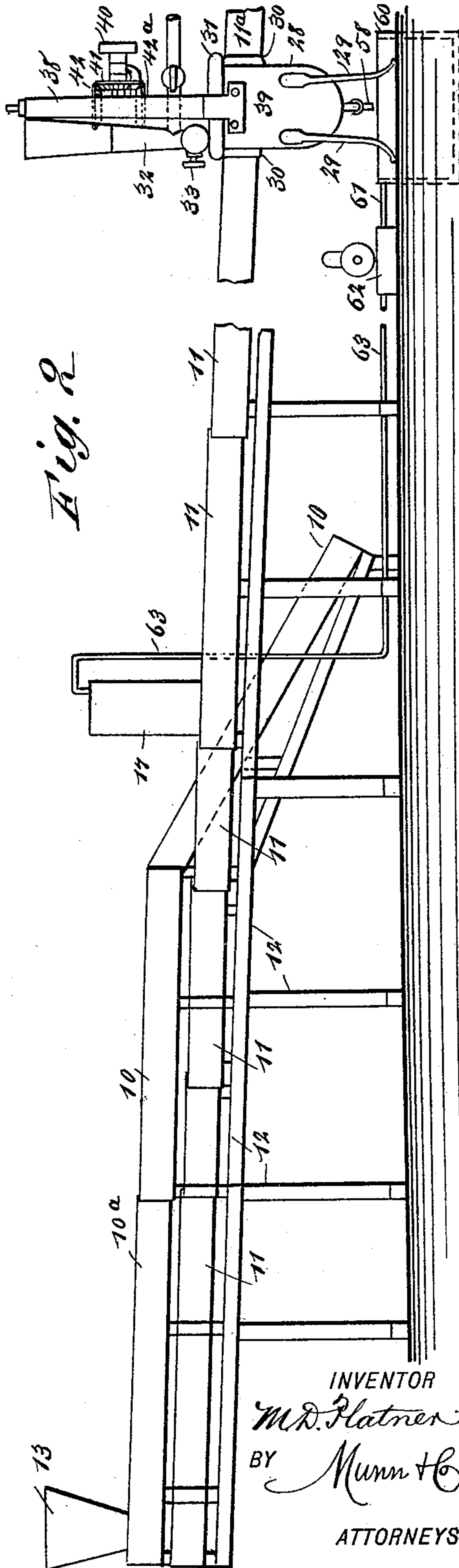
*Fig. 1*



WITNESSES:

*C. Neveu*  
*C. Sedgwick*

*Fig. 2*



INVENTOR

*M. D. Platner*

BY

*Munn & Co*

ATTORNEYS.

(No Model.)

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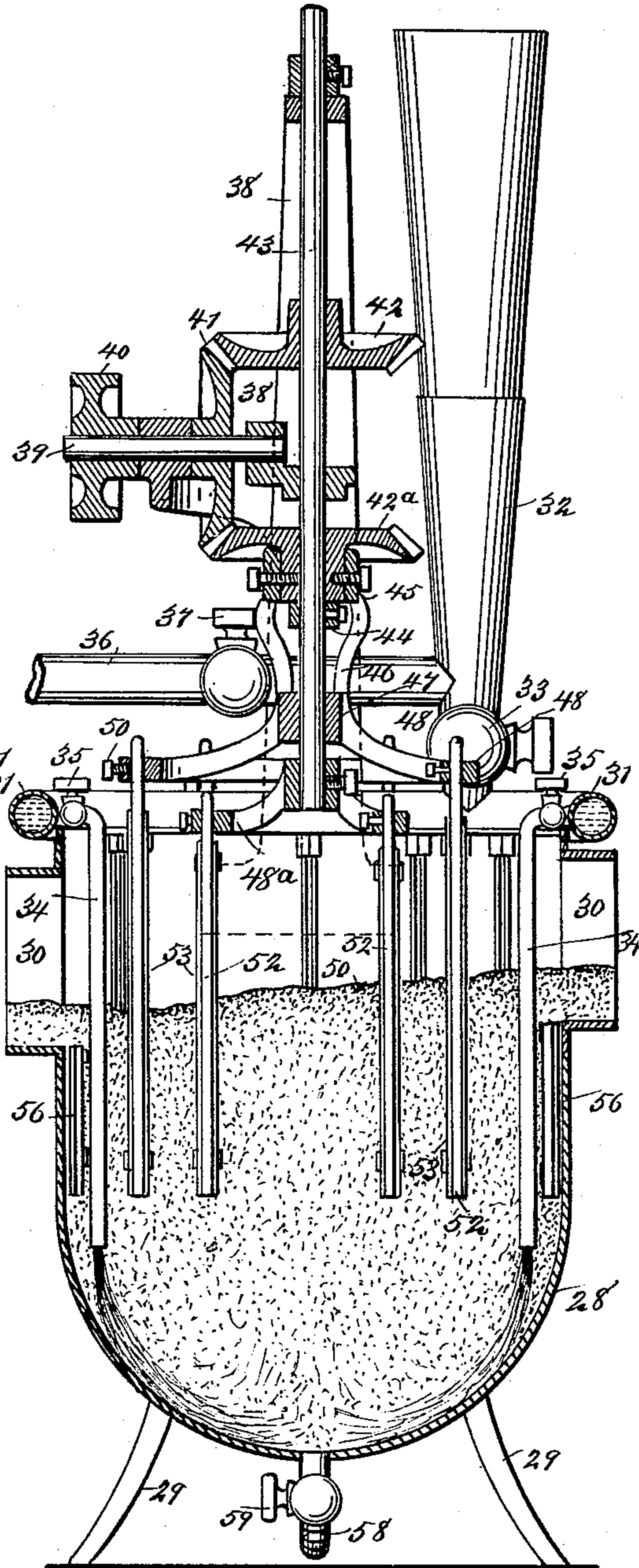
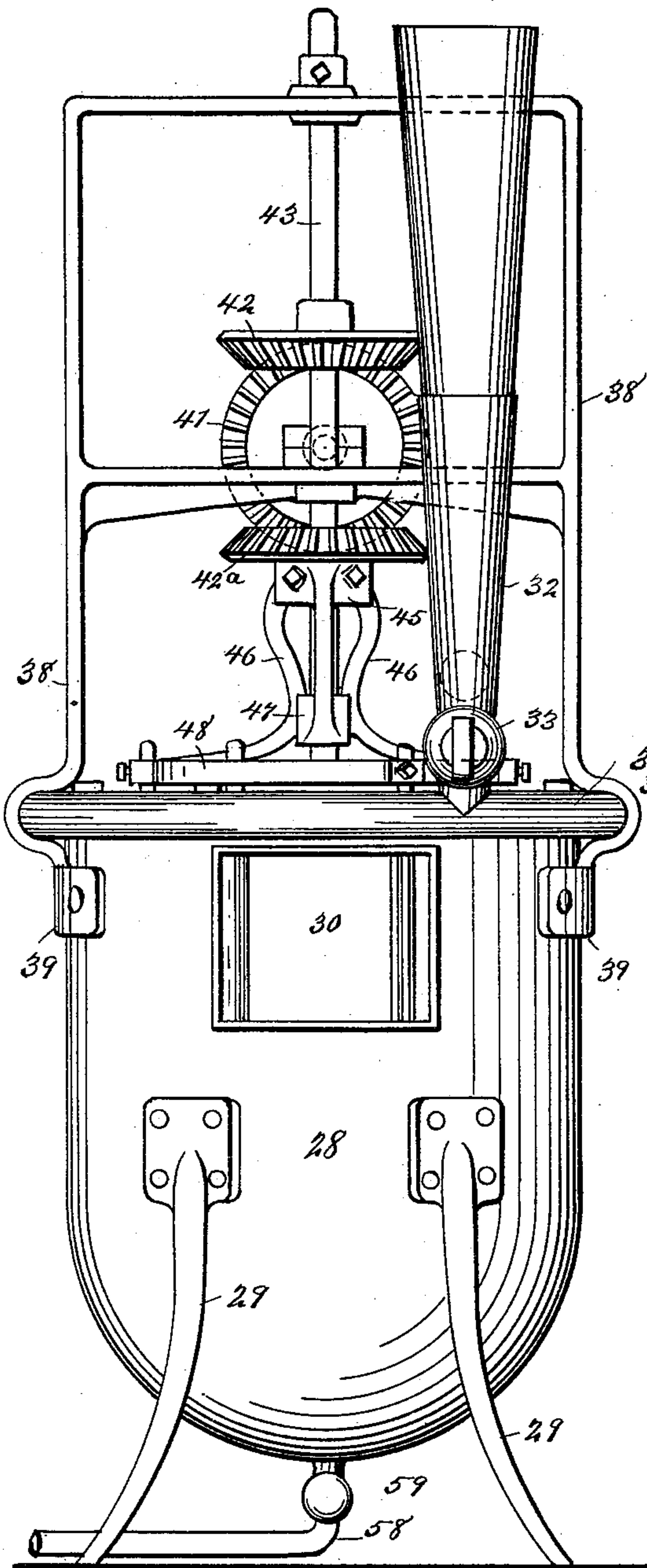
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*Fig. 3*

*Fig. 4*



WITNESSES:

*C. Neveu*  
*C. Bedgwick*

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(No Model.)

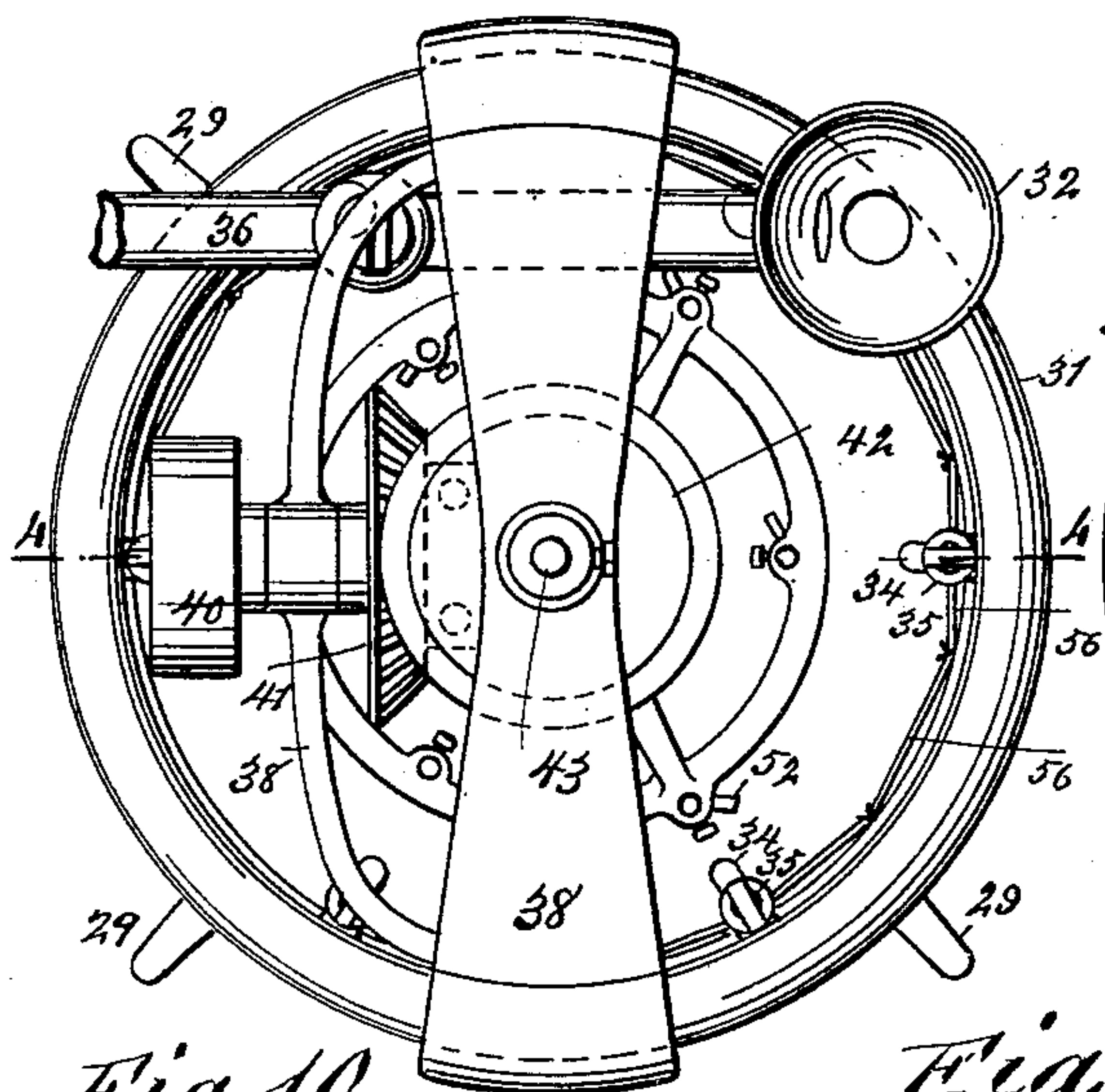
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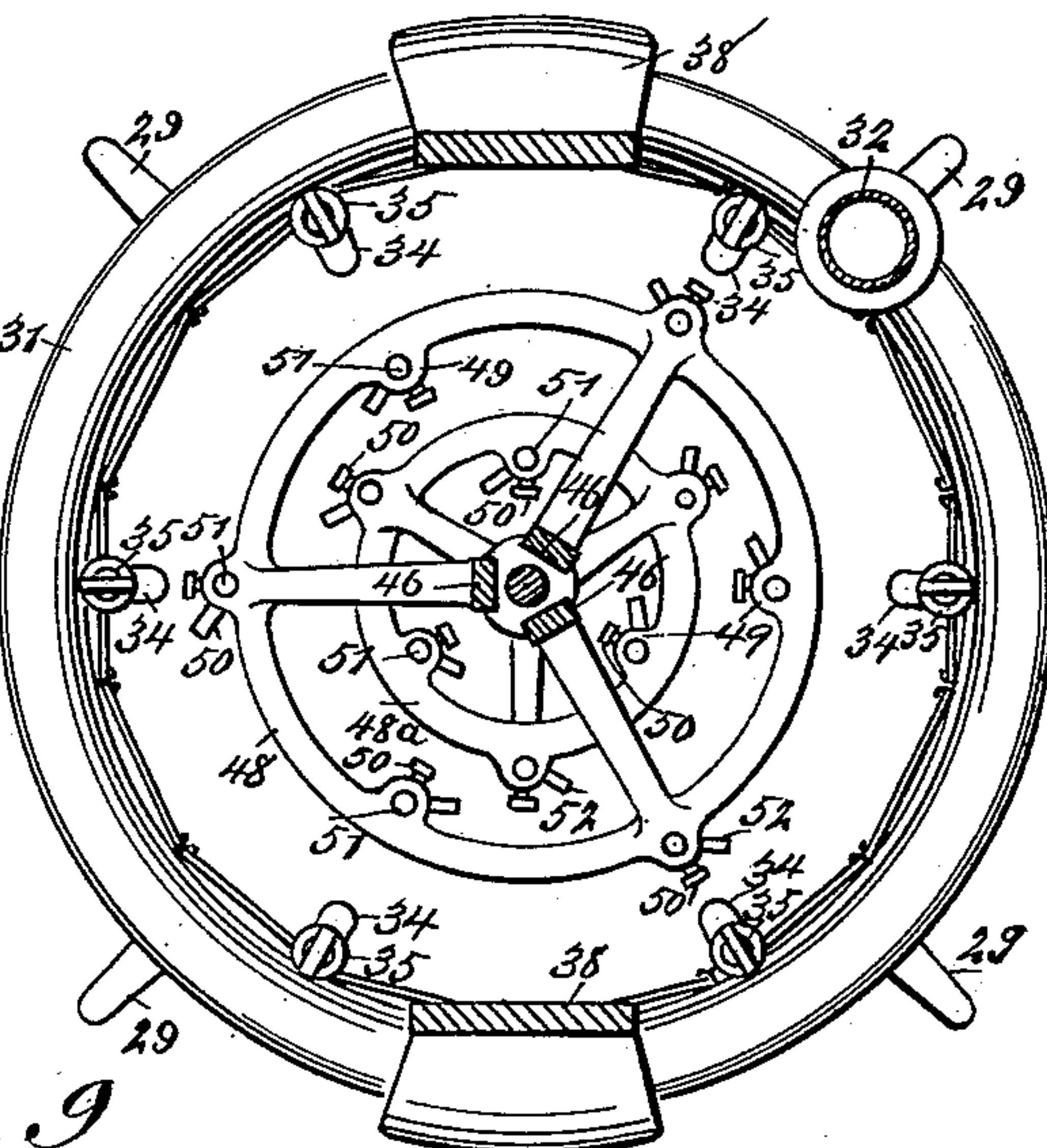
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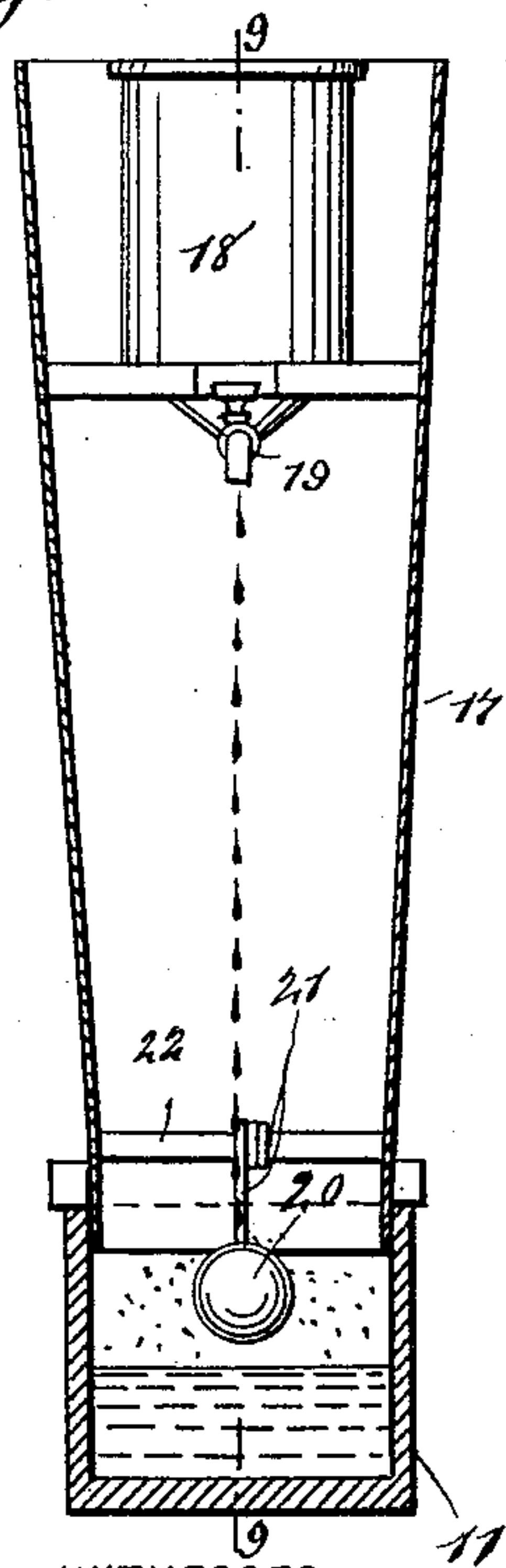
*Fig. 5*



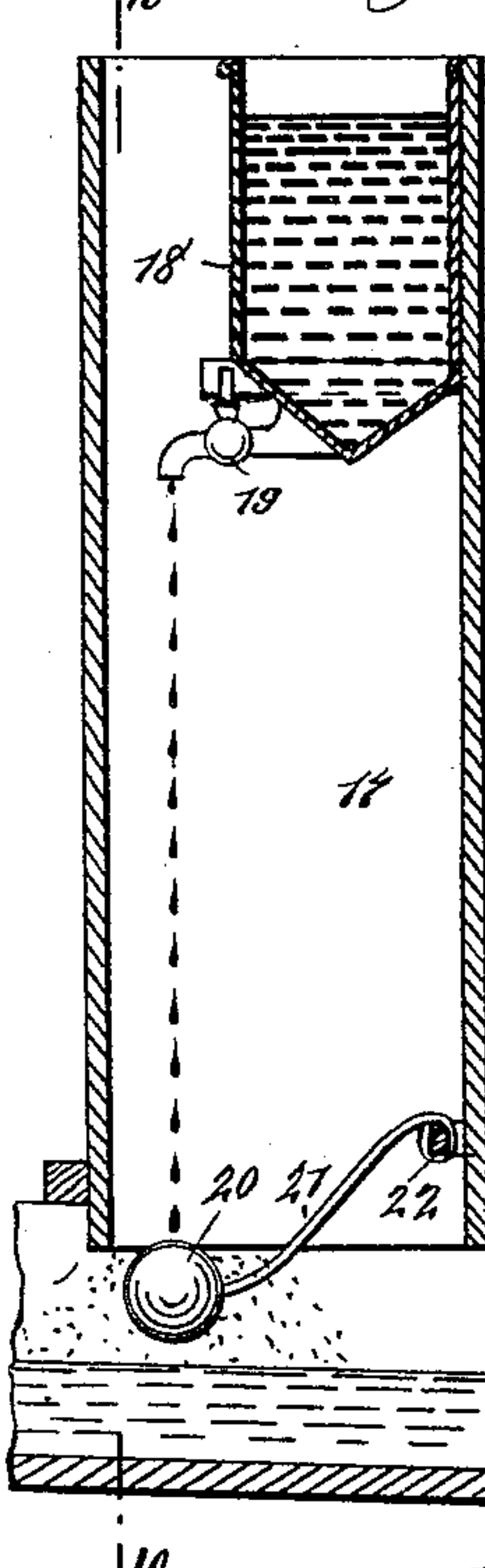
*Fig. 6*



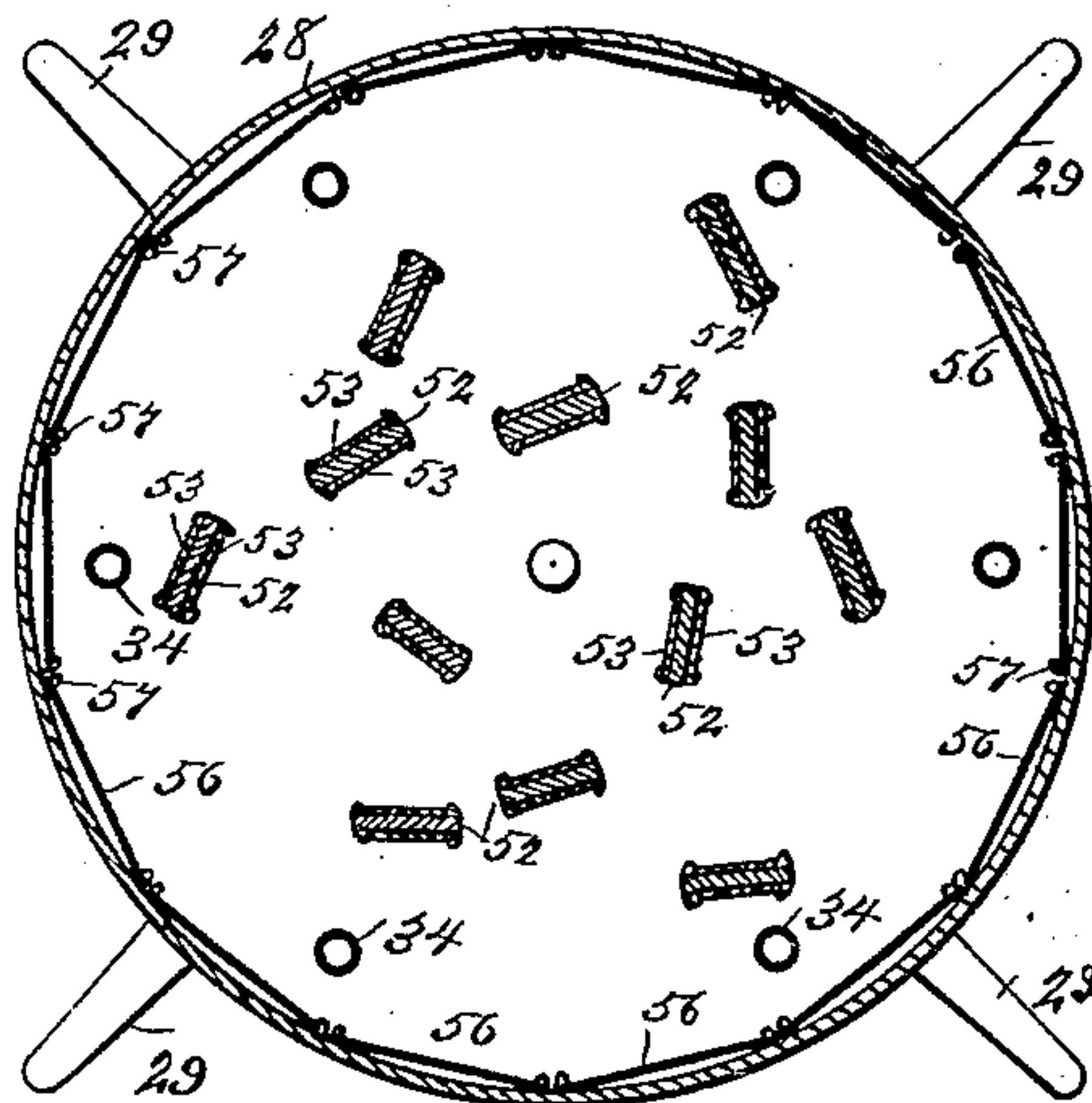
*Fig. 10*



*Fig. 9*



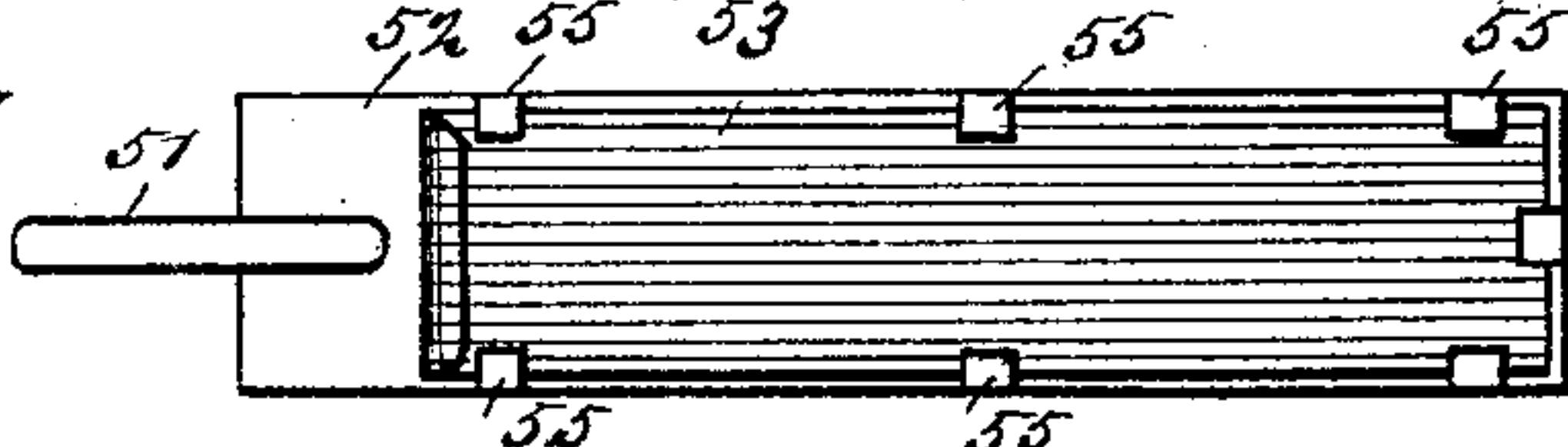
*Fig. 8*



WITNESSES:

*C. Neveu*  
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*Fig. 8*



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(No Model.)

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Fig. 11

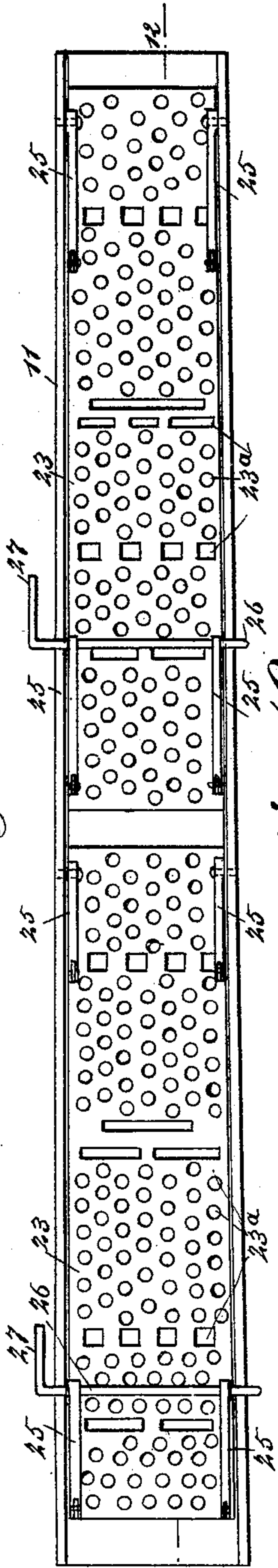


Fig. 12

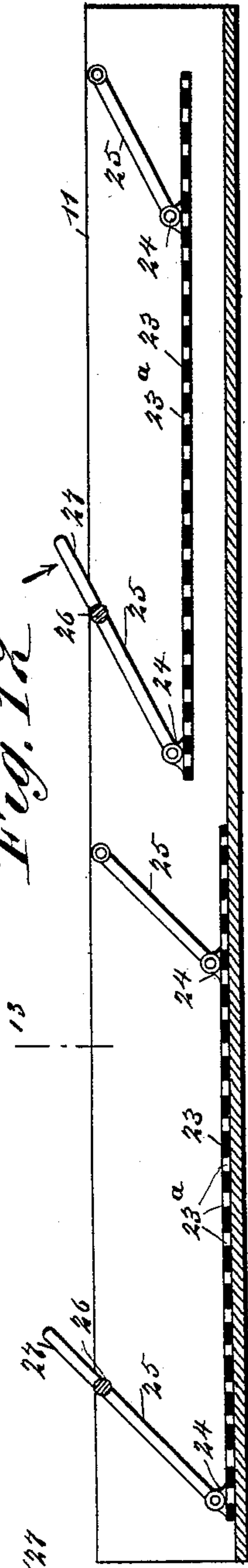


Fig. 14

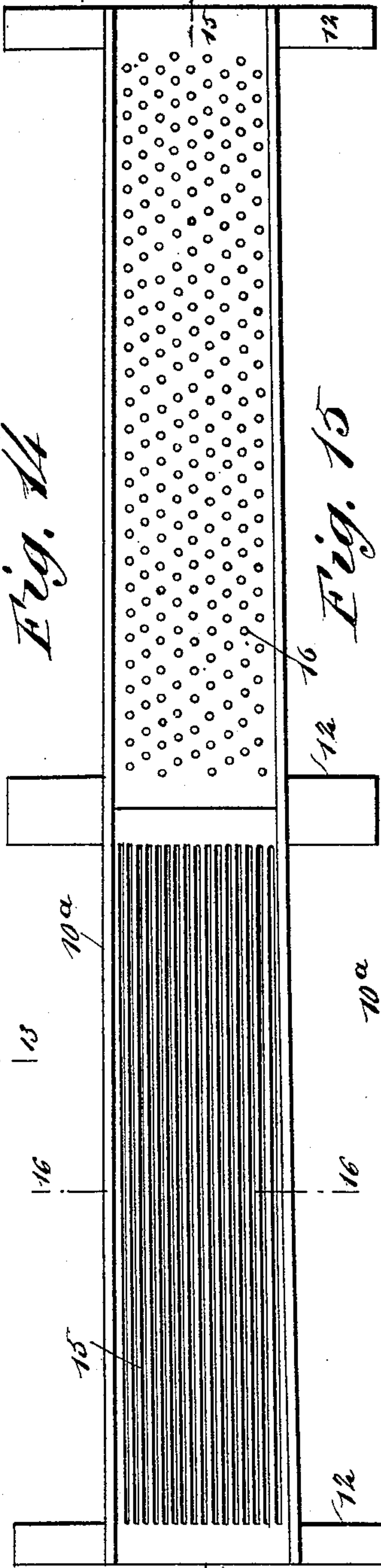
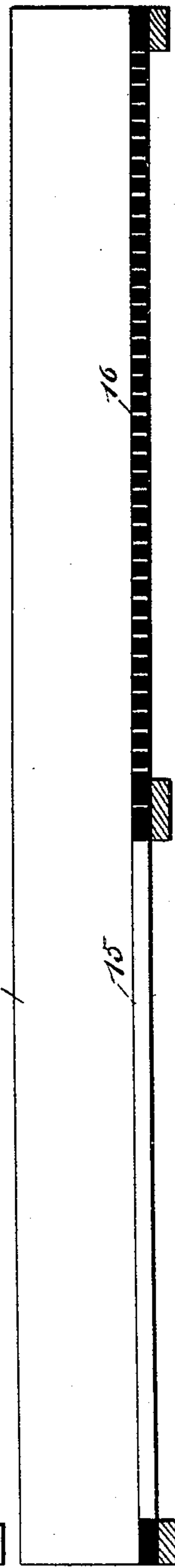


Fig. 15



WITNESSES:

C. Neveux  
C. Sedgwick

Fig. 13

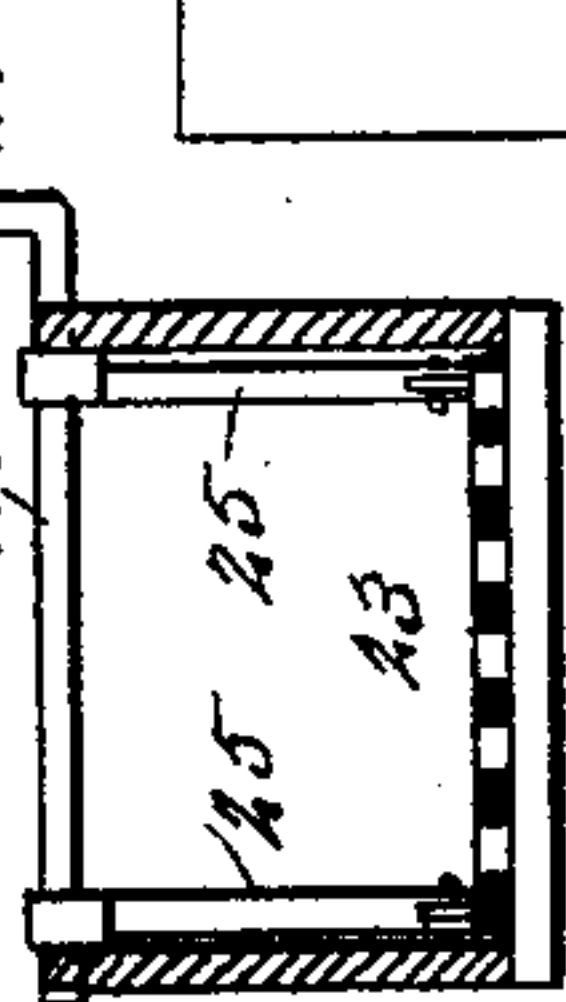
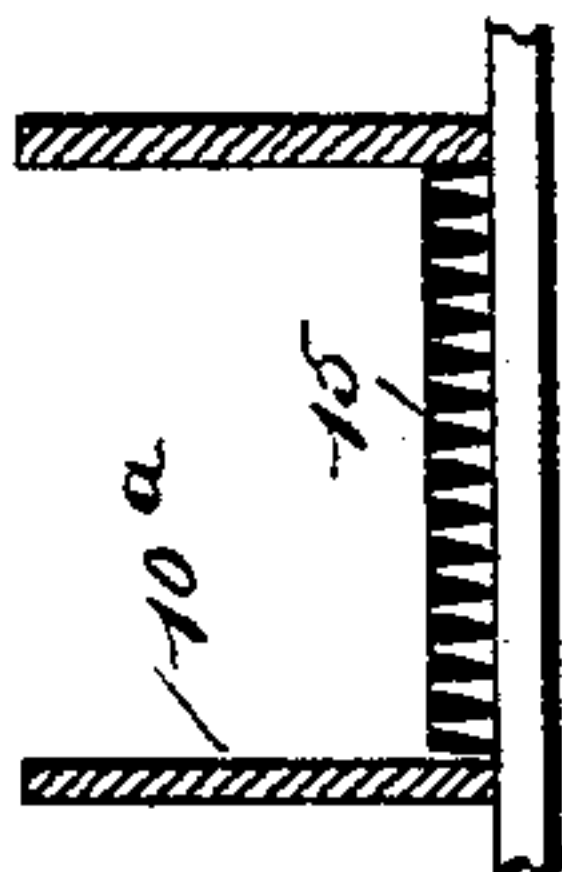


Fig. 16



INVENTOR

M. D. Platner

BY Munn & Co

ATTORNEYS.



# UNITED STATES PATENT OFFICE.

MARSHAL D. PLATNER, OF ELLISTON, MONTANA, ASSIGNOR OF ONE-HALF  
TO ADNA D. PLATNER, OF SAME PLACE.

## PLACER-MINING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 495,832, dated April 18, 1893.

Application filed November 19, 1892. Serial No. 452,498. (No model.)

*To all whom it may concern:*

Be it known that I, MARSHAL D. PLATNER, of Elliston, in the county of Deer Lodge and State of Montana, have invented a new and  
5 Improved Placer-Mining Apparatus, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of apparatus which is adapted for  
10 use in placer mining; and the object of my invention is to produce a simple apparatus by means of which the free gold in the sand may be very rapidly washed out, also to provide an apparatus which may be very economically  
15 operated, which makes a clean separation of sand and gold, and which also is adapted to facilitate the separation of precious stones where such stones occur in the diggings.

To this end my invention consists in certain features of construction and combinations of parts, as will be hereinafter described and claimed.

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

Figure 1 is a broken plan view of the complete apparatus. Fig. 2 is a broken side elevation of the same. Fig. 3 is an enlarged detail side elevation of the concentrating kettle and the mechanism carried thereby. Fig. 4 is a vertical section on the line 4—4 in Figs. 3 and 5. Fig. 5 is a plan view of the concentrating kettle and its mechanism. Fig. 6 is  
35 a sectional plan of the same. Fig. 7 is a cross or sectional view through the kettle showing the arrangement of the stirring blades and water pipes therein. Fig. 8 is an enlarged detail side elevation of one of the stirring  
40 blades. Fig. 9 is a vertical section on the line 9—9 in Fig. 10 and shows the device for sprinkling mercury in the sluiceway. Fig. 10 is a vertical section on the line 10—10 in Fig. 9. Fig. 11 is an enlarged detail plan view of one  
45 of the sluice boxes, showing the movable riffle plates therein. Fig. 12 is a longitudinal section on the line 12—12 in Fig. 11. Fig. 13 is a cross section on the line 13—13 in Fig. 12. Fig. 14 is a plan view of one of the upper  
50 sluice boxes, showing the strainer bottom thereof which separates the heavier and

lighter material. Fig. 15 is a longitudinal section on the line 15—15 in Fig. 14; and Fig. 16 is a cross section on the line 16—16 in Fig. 14.

The apparatus is provided with two sluiceways 10 and 11 arranged one above another and of the general kind in ordinary use, the sluiceways being made up of a plurality of open ended sluice boxes arranged in series, 55 and these are supported on a suitable framework or trestle 12. Both sluiceways are inclined in the usual manner and the upper sluiceway is preferably provided, at its upper end, with a hopper 13 into which the sand to  
60 be washed is delivered. The lower sluiceway is bent outward, as shown at 14, so as to pass from beneath the upper sluiceway, see Fig. 1, and consequently the coarser material, which is carried out through the sluiceway  
65 10, will be delivered by itself and the heavier and finer material which is dropped into the sluiceway 11, as described below, is carried on and delivered into the concentrating kettle which also will be hereinafter described. 75 The upper sluice box 10<sup>a</sup>, of the upper sluiceway, is provided with a sieve-like bottom, one section of the box having its bottom composed of a plurality of parallel bars 15, see Figs. 14 to 16, and these bars are preferably  
80 narrower on their under sides so that the spaces between them will be widest at the bottom, as this construction facilitates the easy passage between the bars of the heavier material in the sand. Instead of using the  
85 bars, however, the floor of the sluiceway may be provided with perforations 16 which serve the same purpose, or any suitable screen bottom may be used.

At a point above the sluiceway 11 and fastened to one of the sluice boxes, is a funnel or pipe 17, in which is secured a mercury tank 18 which has at its lower end an outlet faucet 19, and the faucet delivers upon a ball 20 in the lower end of the funnel or pipe, which  
95 ball is held upon a spring 21 and the latter is secured to a cross bar 22 on one side of the funnel. The tank 18 is arranged near the top of the funnel or pipe 17 and the ball 20, at the bottom, consequently the drops of mercury which are dropped from the faucet 19  
100 strike the ball with considerable force and



the mercury is broken into small fragments and spattered into the sluiceway, so as to have the greatest possible effect in amalgamating the gold which is scattered through the material in the sluiceway.

The sluice boxes of the sluiceway 11, which are arranged below the funnel or pipe 17, are provided with riffle plates 23 which lie normally in the bottoms of the sluice boxes, and these plates are provided with numerous perforations 23<sup>a</sup> which may be of any desired shape, and the perforations in the plates serve to catch the quicksilver and gold like the ordinary riffles of a sluice box. The riffle plates 23 have on their upper sides and near the ends, lugs 24, to which are pivoted supporting cranks 25, and one pair of cranks of each plate is pivoted to the walls of the sluice boxes while the cranks at the other end of the plate are secured to a crank shaft 26, which shaft is journaled on the sluice box and provided with a handle or crank 27 at one end, and by turning the handle 27 and shaft 26 the cranks 25 may be swung upward, thus lifting the plate 23, as shown at the right hand in Fig. 12, and freeing it of the gold and amalgam contained in its perforations.

The riffle plates are permitted to lie flatwise on the bottom of the sluiceway, except when the sluiceway is to be cleaned up, in which event the riffle plates are severally lifted in the manner described, thus permitting the gold and amalgam to pass on and down into the concentrating kettle 28 into which the sluiceway 11 delivers. The kettle 28 is provided with an open top and a round bottom and, as shown in the drawings, it is mounted on legs 29, although the kettle may be supported in any convenient way. The kettle has, near the top and on opposite sides, large openings 30, one of which serves as an outlet for the sand and light material which is discharged through a spout 11<sup>a</sup>, see Figs. 1 and 2.

Around the top of the kettle 28 is a circular water pipe 31 which is supplied by a funnel 32, and the latter may be connected with any suitable source of water supply such as a small stream. The funnel 32 is controlled by a valve 33 and the pipe 31 is provided with numerous branch pipes 34 which lead downward into the kettle and deliver into the lower part thereof, as shown clearly in Fig. 4, these pipes being each controlled by a valve 35. The object of this arrangement is to permit the water to be sent downward into the bottom of the kettle with great force, and consequently, the re-action of the water on the kettle bottom, causes the water to seethe and boil in the kettle, so that only the heavy material, like the gold and mercury, can accumulate in the kettle bottom, the lighter and worthless matter being carried up by the rising water and out through the spout 11<sup>a</sup>.

The funnel 32 connects with a waste pipe 36 at a point above the pipe 31, which pipe is

also controlled by a valve 37, and when it is not desired to have the water flow into the kettle the valve 33 is closed and the valve 37 opened, thus permitting the water to run off through the waste pipe 36. Supported on the kettle and extending well up above it is a frame 38 which is of a generally inverted U-shape, and the frame has feet 39 at its lower end which are secured to the sides of the kettle.

Journaled horizontally in the frame is a suitable driving shaft 39 having a pulley 40 to which power is applied and carrying also a beveled gear wheel 41 which engages gear wheels 42 and 42<sup>a</sup> on the shaft 43, the latter being journaled in the frame 38 in a vertical position and at right angles to the shaft 39. The gear wheel 42 carries the shaft 43, while the gear wheel 42<sup>a</sup> is journaled loosely on the shaft and is held up by a collar 44, see Fig. 4. On the hub of the gear wheel 42<sup>a</sup> is a collar or ring 45, to which are attached the downwardly extending arms 46 which converge slightly and are formed into a bearing 47 adapted to turn on the shaft 43, and below the bearing the arms again diverge and terminate in a circular rotary frame 48. A similar but smaller frame 48<sup>a</sup> is carried by the lower end of the shaft 43, and it will be seen that the shaft 43 will turn the frame 48<sup>a</sup> in one direction, while the gear wheel 42<sup>a</sup> turns the frame 48 in the opposite direction. Each frame 48 and 48<sup>a</sup> is provided with a plurality of circumferential sockets 49 which are intersected by set screws 50, see Fig. 6, and the sockets are adapted to receive the shanks 51 of the stirring blades 52, while the set screws are adapted to bind the shanks in place. The sockets 49 are arranged in different vertical planes and the blades, which are carried by the sockets 49, extend down into the kettle 28 and describe, when revolving, a series of concentric circles, so that the whole mass of material in the kettle is very thoroughly agitated by the blades in addition to being stirred up by the water.

By reference to Figs. 5 and 7 it will be seen that the stirring blades may be turned to any desired angle and held in place by the set screws 50, so that they will have the necessary stirring effect and will throw the sand to the sides of the kettle so that the amalgam will be caught on the amalgam plates which line the sides. Each blade 52 is provided on its opposite sides with copper plates 53 which serve as amalgam plates, these being held to the blades by clips 55, as shown in Fig. 8, the clips being formed on the blades and adapted to embrace the edges of the plates, but other equivalent means of fastening may be provided.

The sides of the kettle are also lined with amalgam plates 56 which are detachably secured to the kettle and which may be held by clips 57, see Fig. 7, or in any other convenient way. The amalgam plates on the several blades and on the side of the kettle serve to collect the amalgam, and the amalgam also



drips from the plates and settles in a body in the kettle bottom. Opening from the bottom of the kettle 28 is an outlet pipe 58 which is controlled by a valve 59, and which delivers  
 5 into a tank 60 arranged on a lower level than the kettle, and leading from the tank is a pipe 61 which connects with a pump 62 and the latter connects by a pipe 63 with the mercury tank 18, see Figs. 1 and 2. In this way the  
 10 amalgam, which has accumulated in the bottom of the kettle, may be withdrawn and again passed through the mercury tank and concentrating kettle, the operation being repeated until the gold is sufficiently concentrated, after which it may be separated from  
 15 the amalgam in the usual way.

The operation of the apparatus is as follows:—The material to be washed is delivered into the hopper 13 and from the hopper into  
 20 the upper sluiceway 10, a suitable supply of water being permitted to flow through the sluiceway and also through the sluiceway beneath it. When the sand strikes the perforated floor 15 and 16 of the upper sluice  
 25 box 10<sup>a</sup>, the heavier and finer material falls through the perforated floor of the upper sluice box 10<sup>a</sup> and into the sluiceway 11, while the coarser and lighter materials are carried  
 30 on and delivered at the lower end of the sluiceway 10. It will be seen that if this coarser material contains precious stones, the washing of the material in the sluiceway will serve to partially separate the stones from the  
 35 other matter, so that they may be easily picked out. The fine and coarse material which contains the gold and which is dropped into the sluiceway 11, is washed down into the upper part of the sluiceway, and when it passes beneath the funnel or pipe 17 a spray of quick-  
 40 silver is delivered into it and the quicksilver and gold amalgamate in the usual way and are caught in the perforations of the riffle plates 23, and the worthless material passes on and out through the kettle 28. When the  
 45 sluiceway is cleaned up the riffle plates are raised in the manner described and the matter contained in the perforations is washed down into the kettle 28, where a further concentration takes place in the manner already  
 50 described.

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

1. An apparatus of the character described, comprising an upper sluiceway having a perforated floor, a lower sluiceway arranged beneath the upper sluiceway and diverging from the same, and a concentrating kettle arranged to receive the material discharged from the  
 55 lower sluiceway, substantially as described.

2. An apparatus of the character described, comprising an upper sluiceway having a perforated floor, a lower sluiceway arranged beneath the upper one and diverging from the  
 65 same, a mercury tank arranged to discharge into the lower sluiceway, movable riffle plates held in the lower sluiceway at a point below

the mercury tank, and a concentrating device adapted to receive the material discharged by the lower sluiceway, substantially as described. 70

3. In an apparatus of the character described, the combination with the sluiceway having riffle plates therein, of a mercury tank held above the sluiceway and adapted to discharge therein, and a spattering or spraying  
 75 device arranged between the discharge of the tank and the sluiceway, substantially as described.

4. An apparatus of the character described, comprising an upper sluiceway having a perforated floor, a lower sluiceway arranged beneath the upper sluiceway and diverging therefrom, a mercury tank arranged to deliver into the lower sluiceway, riffle plates arranged in the lower sluiceway at a point below the tank, a concentrating device arranged to receive the discharge from the lower sluiceway, and a pump arranged to force the amalgam from the concentrating device back to  
 80 the mercury tank, substantially as described.

5. The combination with the sluiceway, of the perforated movable riffle plates arranged in the bottom of the sluiceway, substantially  
 85 as described.

6. The combination with the sluiceway, of the perforated riffle plates hung therein and adapted to rest upon the bottom thereof, and a mechanism for swinging the riffle plates from the bottom of the sluiceway, substantially  
 90 as described.

7. In an apparatus of the character described, a concentrating kettle having opposite side openings near the top, and an outlet in the bottom and provided with amalgamating plates on its sides, in combination with water pipes discharging into the lower portion of the kettle, and revolving stirring blades in said kettle, substantially as described. 100

8. In an apparatus of the character described, the concentrating device comprising a tight bottomed kettle having a discharge pipe at the bottom and side openings near the top, a plurality of water pipes arranged to discharge into the lower portion of the kettle, and a series of revoluble stirring blades held to turn in different planes in the kettle, substantially as described. 105

9. In an apparatus of the character described, the concentrating device comprising a tight bottomed kettle having a discharge at the bottom and side openings near the top, and provided with amalgamating plates on its sides a water pipe arranged to deliver into the lower portion of the kettle, oppositely revolving frames above the kettle top, and stirring blades carried by the frames and extending downward into the kettle, substantially as described. 110

10. The combination with the concentrating kettle having a discharge pipe at the bottom and side openings at the top, of a circular water supply pipe extending around the  
 115



kettle top, and valve-controlled branch pipes opening from the supply pipe and delivering into the lower portion of the kettle, substantially as described.

5 11. The combination with a concentrating kettle provided with amalgamating plates on its sides, of oppositely revolving stirring blades provided with amalgamating plates, a  
10 circular water supply pipe at the top of the kettle, and branch pipes leading from the supply pipe down into the kettle, substantially as described.

12. A placer mining apparatus, comprising  
15 a sluice way, a mercury holding receptacle for delivering mercury to the sluice way, a

concentrating kettle, water pipes for delivering water to the lower portion of the kettle, and revolving stirring blades in the kettle, substantially as described.

13. A placer mining apparatus, comprising 20  
a sluice way, a mercury distributing device above the sluice way, a concentrating kettle, water delivering pipes extending down into the kettle, and oppositely revolving stirring  
25 blades in the kettle, substantially as herein shown and described.

MARSHAL D. PLATNER.

Witnesses:

WARREN B. HUTCHINSON,  
C. SEDGWICK.