

No. 820,234.

PATENTED MAY 8, 1906.

I. F. MONELL.

ORE SLIMER.

APPLICATION FILED MAR. 9, 1905.

3 SHEETS—SHEET 1.

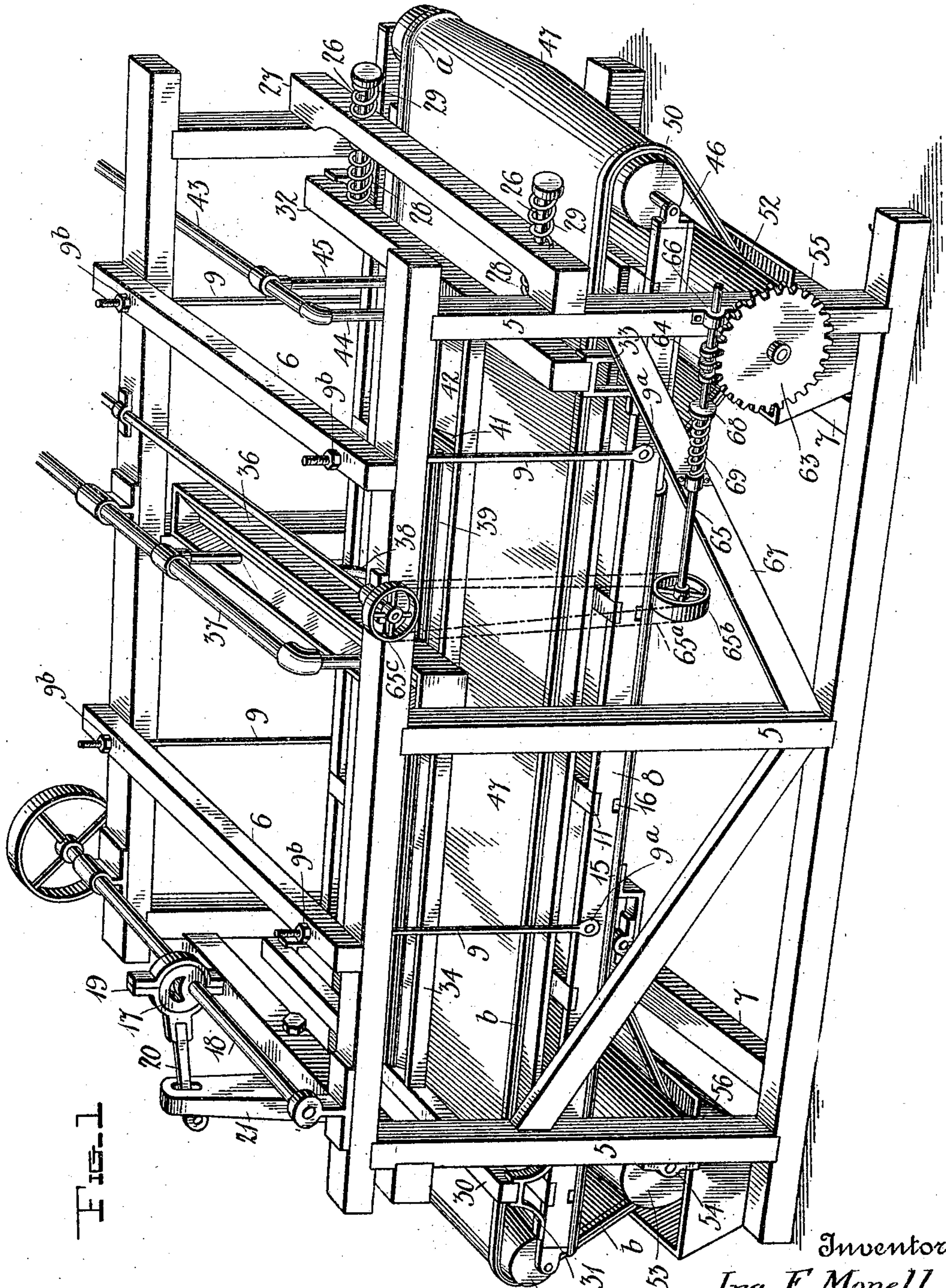


FIG. 1

Witnesses
[Signature]
C. H. Griesbauer

Inventor
Ira F. Monell

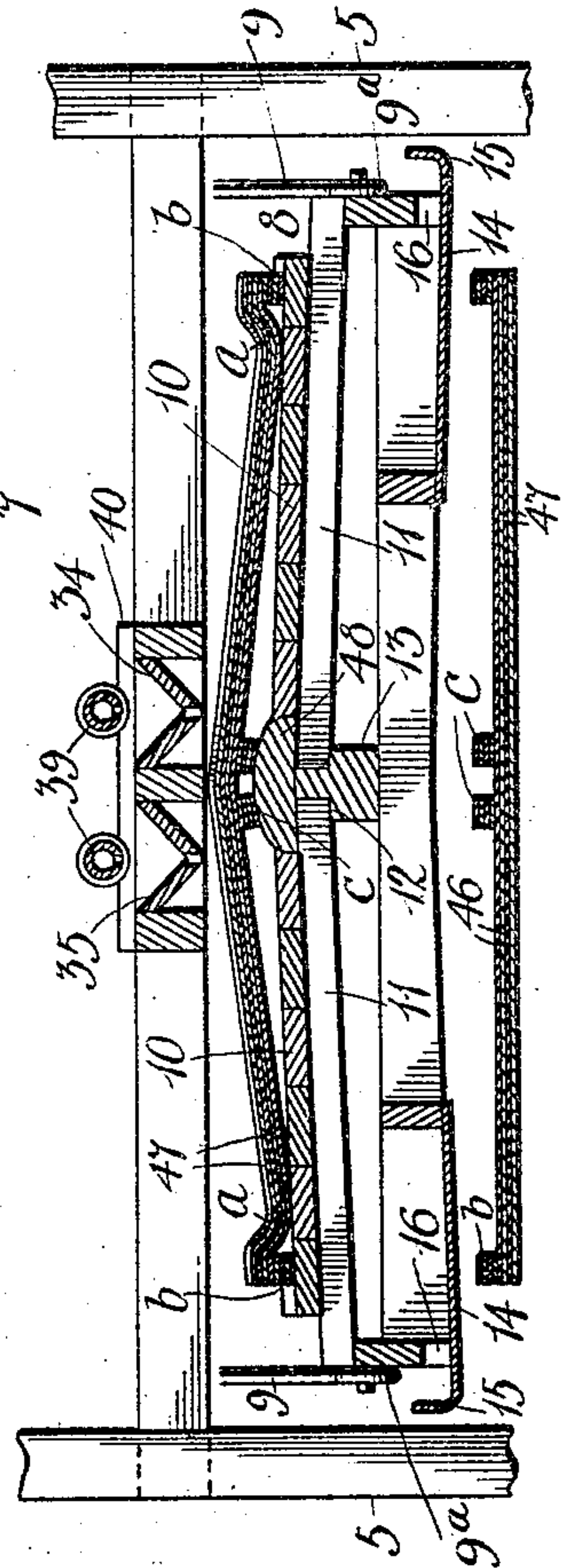
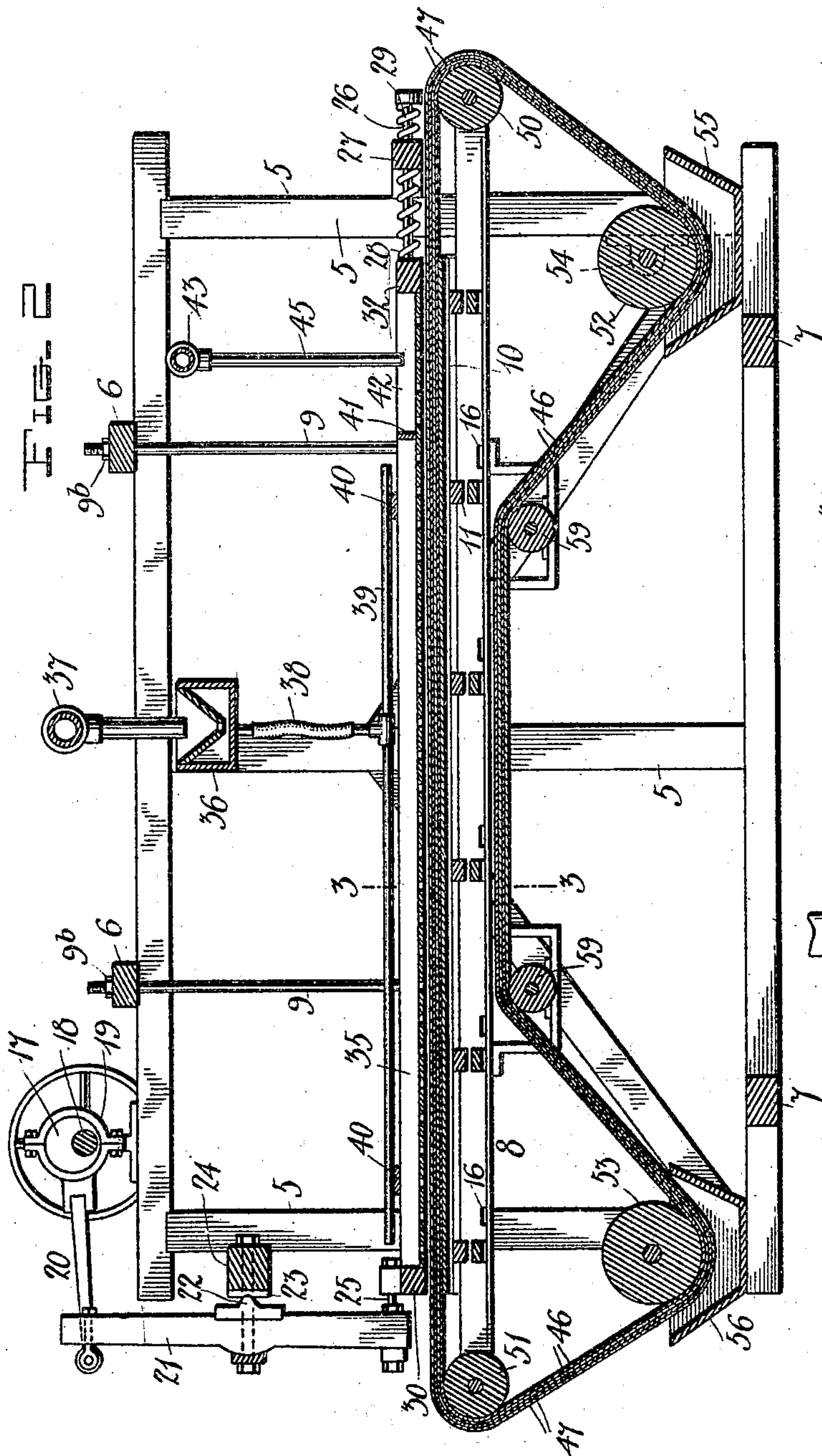
By *[Signature]*
Attorney

No. 820,234.

PATENTED MAY 8, 1906.

I. F. MONELL.
ORE SLIMER.
APPLICATION FILED MAR. 9, 1905.

3 SHEETS—SHEET 2.



Witnesses.
J. H. B. B. B.
C. H. Griesbauer.

Inventor
Ira F. Monell
by *A. B. Wilson*
Attorney

No. 820,234.

PATENTED MAY 8, 1906.

I. F. MONELL.
ORE SLIMER.

APPLICATION FILED MAR. 9, 1905.

3 SHEETS—SHEET 3.

FIG. 4

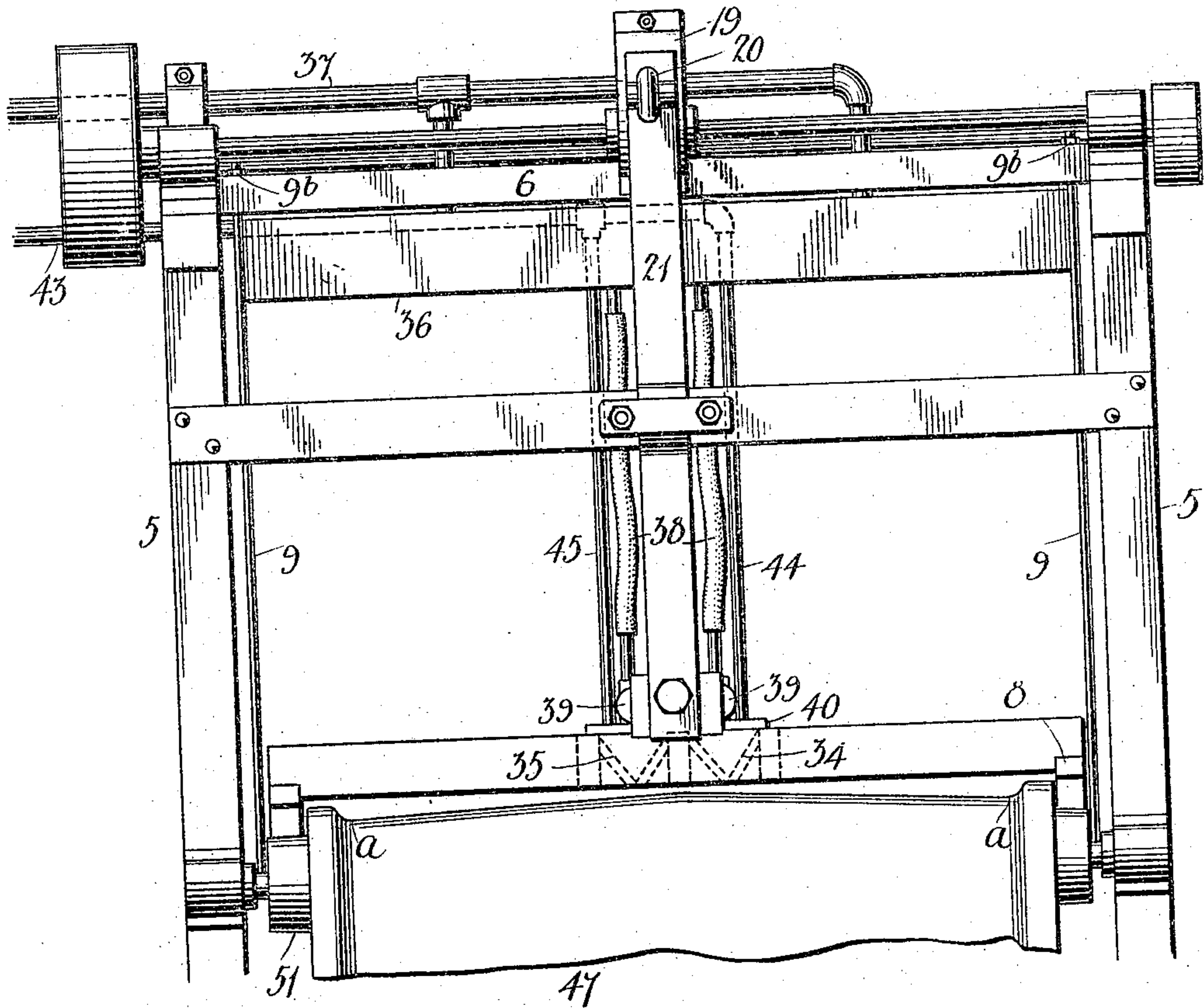
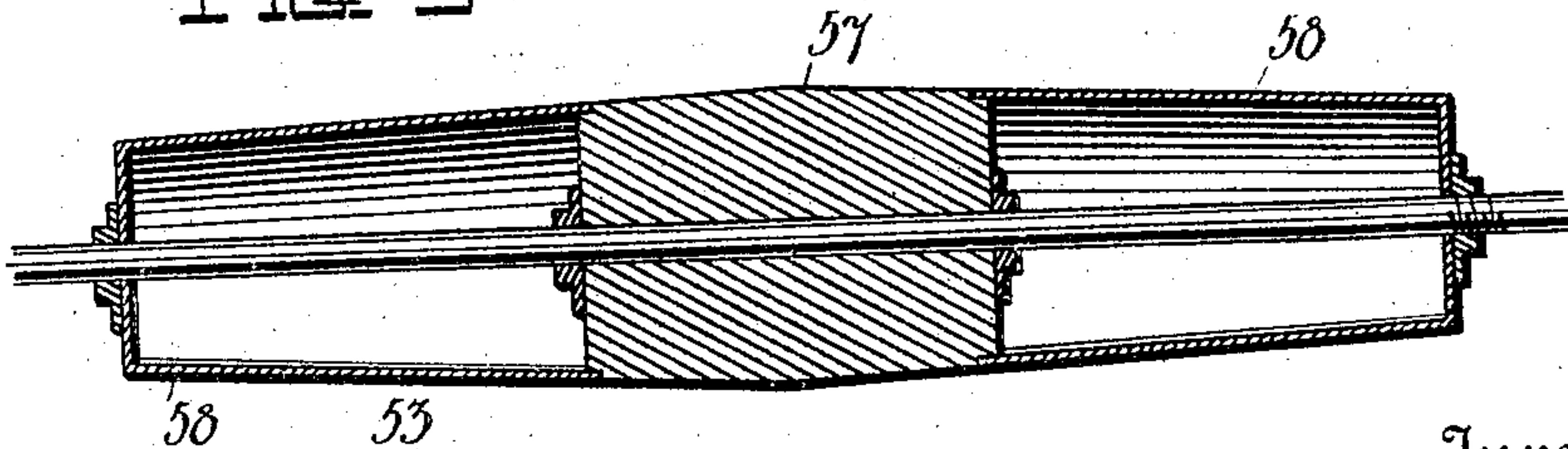


FIG. 5



Witnesses
E. H. Brown
C. H. Griesbauer

Inventor
Ira F. Monell
by *A. B. Wilson*
Attorney

UNITED STATES PATENT OFFICE.

IRA FERRIS MONELL, OF BOULDER, COLORADO.

ORE-SLIMER.

No. 820,234.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed March 9, 1905. Serial No. 249,312.

To all whom it may concern:

Be it known that I, IRA FERRIS MONELL, a citizen of the United States, residing at Boulder, in the county of Boulder and State of Colorado, have invented certain new and useful Improvements in Ore-Slimers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in ore-slimers; and one of the principal objects of the same is to provide an efficient, durable, and simple machine for recovering fine particles of gold, tungsten, and other fine mineral substances from slime-water, fine sands, and middlings which pass off with the water and tailings.

Another object of my invention is to improve the construction of the endless belt which passes around the drums and through the washing-tanks.

Still another object is to simplify the construction of machines of this character and to render them more efficient in use and less liable to get out of order.

These and other objects are attained by means of the construction illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of a machine embodying my invention. Fig. 2 is a longitudinal sectional view of the same. Fig. 3 is a transverse section on the line 3 3 of Fig. 2. Fig. 4 is an end elevation with certain parts broken away, and Fig. 5 is a longitudinal sectional view of one of the drums or rollers for the endless belt.

Referring to the drawings for a more particular description of my invention, the numeral 5 designates the uprights, 6 the top cross-bars, and 7 the bottom cross-bars, of the main frame of the machine. Suspended from the main frame is an oscillating frame 8, said frame being supported upon eye-rods 9, said eye-rods consisting of an eye portion 9^a, pivotally connected to the frame, and the upper end of said eye-rods extending through the longitudinal side bars of the frame and through the top cross-bars 6, at the top of which a nut 9^b is turned upon the eye-rods to adjust the swinging frame vertically with relation to the main frame of the machine. The eye-rods 9 may be sufficiently elastic to permit a vibratory or oscillatory movement of the swinging frame, or other provision may

be made for the movement of said eye-rods within the bar 6. Removably supported upon the swinging frame is a flooring or base-bed consisting of longitudinally-disposed strips 10 of wood, which are extended from the center outward at a slight inclination, as shown, and said strips are supported upon cross-bars 11, seated in recesses 12, formed in a longitudinal bar 13, secured centrally lengthwise of the swinging frame. This bar 13 gradually lessens in height from the inlet to the outlet end of the machine—that is, from the right-hand end of the machine as shown in Fig. 2 to the opposite end—and therefore the incline laterally of the bottom boards will gradually diminish, and it may be stated that these boards are flexible or yielding, and therefore with the pitch as above mentioned the endless apron or belt being movable over the bottom boards will be prevented from wrinkling and will work smoothly over the same. The bottom boards terminate inwardly from the side of the swinging frame, leaving an opening through which the material may pass into pans 14, secured to the under side of the swinging frame at the sides and outward of the outer rails of the frame. The said pans are provided with troughs 15 for receiving tailings which pass from the pans 14 through ports 16 in the side rails of the swinging frame.

Oscillatory motion is imparted to the frame 18 from an eccentric 17, secured to a driving-shaft 18 and engaged by an eccentric-strap 19, from which an eccentric-rod 20 extends to a connection with a lever 21, which at about its center has a knife-edge fulcrum bearing-block 22, engaging in a fulcrum member 23, attached to a cross-bar 24 from the main frame. At the lower end of the lever 21 is a rod connection 25 with an end rail of the swinging frame. At the opposite end rods 26 extend from the swinging frame through openings in a cross-bar 27. Buffer-springs 28 are arranged between the ends of the frame and the cross-bar 27, and similar springs 29 are placed between the outer side or bar 27 and the heads of the rods.

It will be noted that the lever 21 and the rods 28 are not directly attached to the swinging frame—that is to say, the rod 25 connects with a cross-bar 30, supported on standards 31, bolted to the side rails of the oscillating frame, while the rods 26 extend from a cross-bar 32, supported by standards 33, bolted to the frame.

Supported by the cross-bars 30 and 32 and extending along the machine at each side of the center thereof are distributing-troughs 34 35. These troughs are shown as V-shaped in cross-section and are perforated at intervals for the discharge of material onto the endless apron or belt, which will be hereinafter described. Material is fed to these distributing-troughs from a stock-trough 36, supported in the main frame and receiving the stock from a pipe 37. This stock-trough 36 has flexible pipe connections 38 with tubes 39, which are perforated upon their under sides and supported on cross-strips 40, attached to the upper sides of the troughs. At its upper or inlet end each trough is provided with a partition 41, which forms one wall of a tray 42 for receiving clear water for cleansing purposes, and water is supplied to these trays from a main water-pipe 43, from which branches 44 45 lead to said trays. The trays 42 are perforated.

The endless belt or apron consists of two layers of material 46 47, the inner layer being of sheet-rubber, while the other layer or working surface is of canvas. This permits of sufficient flexibility to the apron or belt without danger of its becoming distorted. At the longitudinal center the upper stretch of the apron or belt passes over an elevated crown-strip 48, placed above the bar 13. From this crown-strip the apron slopes downward on the bottom boards to nearly the edge thereof. Secured longitudinally of the belt at its opposite edges are narrow strips *b* of four-ply belt material, said strips being riveted or otherwise secured to the belt for the purpose of raising the edge of the belt to an extent sufficient to form pockets *a* contiguous to the strips, the purpose being to collect fine mineral particles which do not catch in the canvas and will find their way into the pockets as the belt moves over the rollers. The strips *b* may be of greater or lesser thickness, depending upon the class of work to be done by the machine. Should the material to be treated consist of coarse sand, the strips should be thicker than if fine sand is being treated. A strip or strips of belting material may be secured longitudinally and centrally to the belt, said strips *c* serving to insure a smooth working of the belt. Owing to the fact that the belt would be inclined to stretch upon a central longitudinal line, the strips would tend to hold the belt in a smooth flat condition upon the rollers.

It will be understood that as the belt passes over the bottom boards said belt is forced upwardly, as indicated in Fig. 3, thus practically forming the pockets *a* and preventing the material from passing off over the edge of the belt.

Mounted in the ends of the oscillating frame are rollers 51, which are tapered from the center outward in both directions, so as to main-

tain the form of the apron or belt. Drums 52 53 are journaled in boxes 54, secured to upright bars of the frame, said drums being disposed within the washing-tanks 55 56 and permitted to have slight oscillation or movement therein by the tension of the belt 47. It will be noted that the drums 52 53 are also tapered from their centers outward in both directions, and preferably these drums, or at least the driving-drums, will consist of a central section 57, made of wood, and hollow metal extensions 58, secured to the ends thereof. The central wood section 57 will serve as the driving-surface for the endless apron—that is to say, the surface of said section will create sufficient friction for the apron to drive it. The belt 47 passes around the rollers 50 51, the drums 52 53, and over idlers 59, supported on the under side of the swinging frame. On one end of the shaft of drum 52 is a worm-gear 63, which engages a worm 64, the shaft 65 of which has slight longitudinal movement, so as to keep the worm in engagement with the worm-wheel during the oscillation of the frame, and the slight oscillatory movement of the drums in the washing-tanks. The shaft 65 is rotated by means of a belt 65^a, which passes around a pulley 65^b, attached to the shaft 65 and passing around a pulley 65^c, journaled at the top of the frame of the machine. The shaft 65 is mounted to slide in a bearing 66 on one of the end uprights in the machine-frame and also to slide in a block mounted on the inner side of a brace-bar 67, and between this block and the brace-bar and the collar 68 on the shaft is a coil-spring 69, which maintains the shaft and worm in proper relation and meshing with the worm-wheel.

The operation of my invention may be described as follows: The sand or other material containing small particles of gold or other minerals is discharged into the trough 36, from which it passes into two pipes 39 and thence into the distributing-troughs 34 and 35, from which the material will discharge onto the endless apron on opposite sides to its center, and the separation will take place by the reciprocating or swinging movement of the apron. The water and slime will pass over the edges of the apron into the pans 14, and the mineral substances will be carried by the apron first into the washing-tank 56, where the greater part, if not all, of the material will be washed off and fall to the bottom of the tank. Should any of the particles cling to the apron, they will be removed in the tank 55. For washing the apron clear water is admitted from the tank 43 to the trays 42, from which the water passes through the perforations onto the apron. The pockets *a* at the sides of the belt serve to collect fine particles of mineral, and this feature of my invention is deemed of some importance.

Various changes in the form, proportion, 130

and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

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

1. In a machine of the character described, an endless apron or belt having its upper 10 stretch inclined from its longitudinal center outwardly, strips secured underneath the edges of said apron to form pockets along the upper edges of said apron, strips secured underneath the longitudinal center of said 15 apron, in combination with oppositely-tapered rollers over which said belt travels, an oppositely-inclined flooring having an elevated crown-strip, over which the center strips of the belt pass, and means for discharging 20 pulp upon the opposite sides of the longitudinal center of the belt.

2. In a machine of the character described, a main frame, a longitudinally-oscillating frame suspended from the main frame, a bed 25 consisting of yielding boards arranged on said oscillating frame, said boards being inclined downward from the center, the incline diminishing from one end to the other thereof, rollers tapered from their centers toward their 30 ends, an endless apron movable around said

rollers and over the bed, and means for feeding pulp near the transverse center of the upper stretch of said apron.

3. In a machine of the character described, a main frame, a frame having longitudinal 35 oscillating movement in said main frame, bottom boards extended lengthwise of the main frame and inclined downward from the center outward in both directions, a central longitudinal upwardly-extended crown-piece, and 40 an endless apron engaging said crown-piece and passing over the bottom boards, the edges of said apron being raised to form pockets.

4. In a machine of the character described, a main frame, a reciprocating frame therein, 45 pans arranged at the under side of said frame and having trough portions extended outward from the sides of the frame, the side walls of said frame being provided with discharge-ports leading to said troughs, and an 50 endless apron arranged to travel over the reciprocating frame.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

IRA FERRIS MONELL.

Witnesses:

EDWIN J. FINCH,
RALPH P. METCALF.