

(No Model.)

W. A. MERRALLS.
CONVEYER AND SEPARATOR APRON FOR MINING MACHINERY.
No. 449,942.

Patented Apr. 7, 1891.

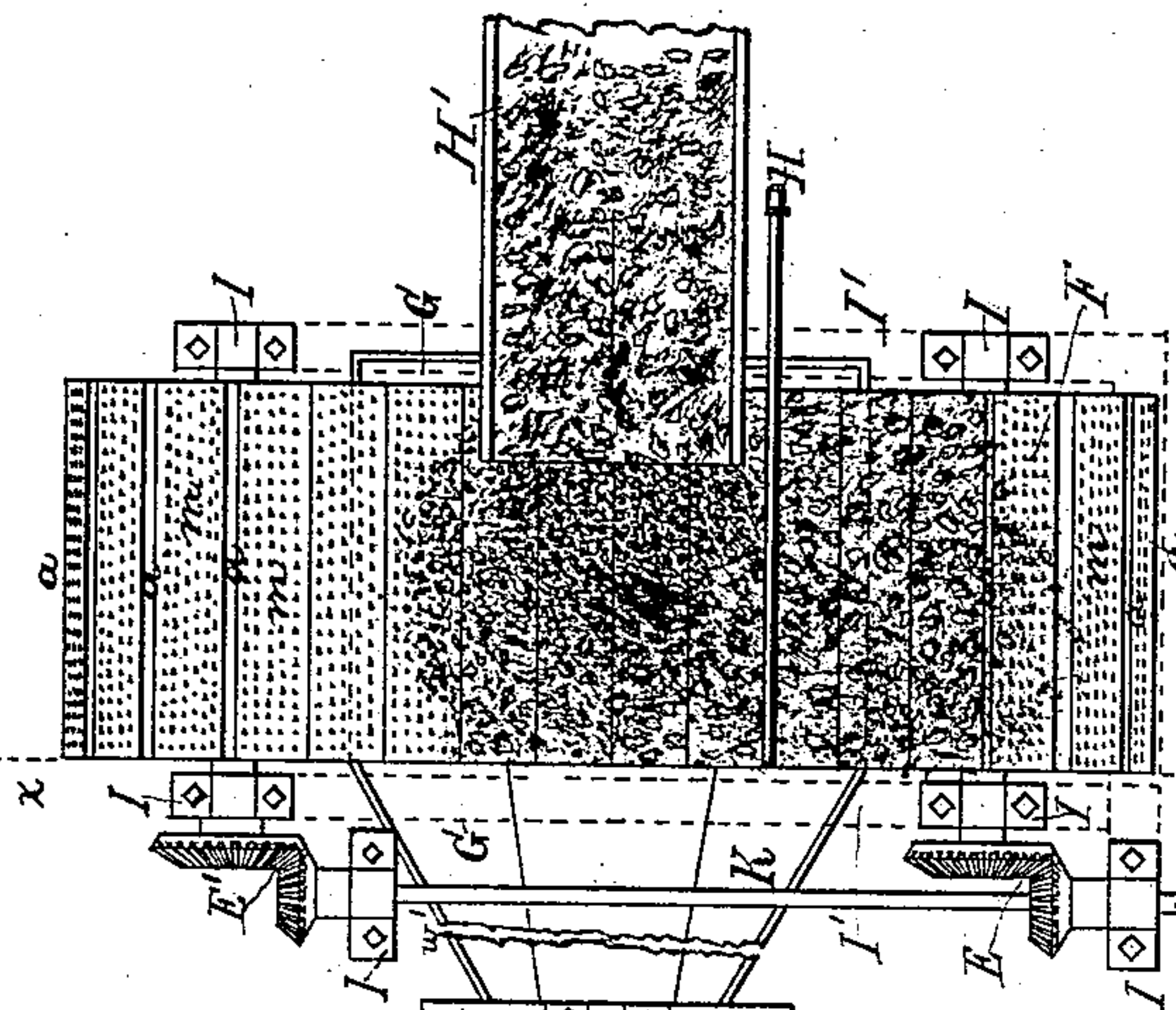


Fig. 1.

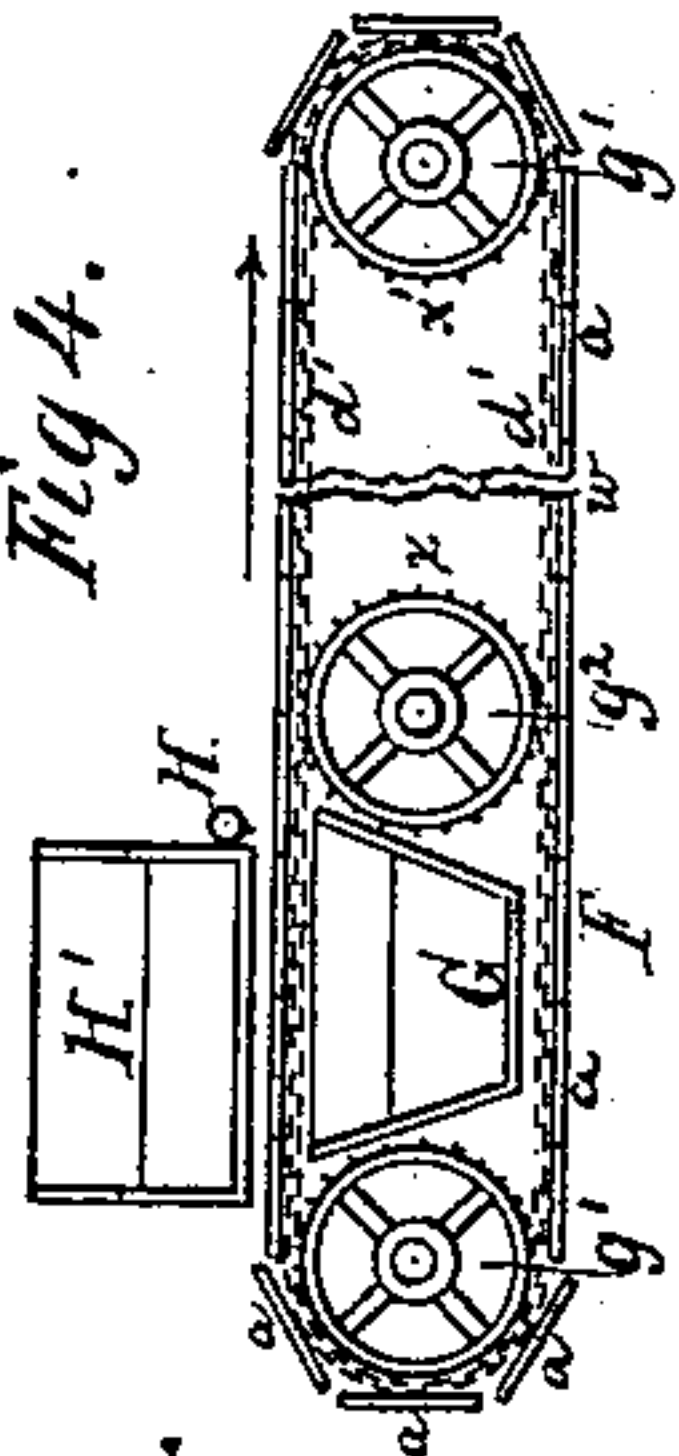


Fig. 4.

Witnesses:
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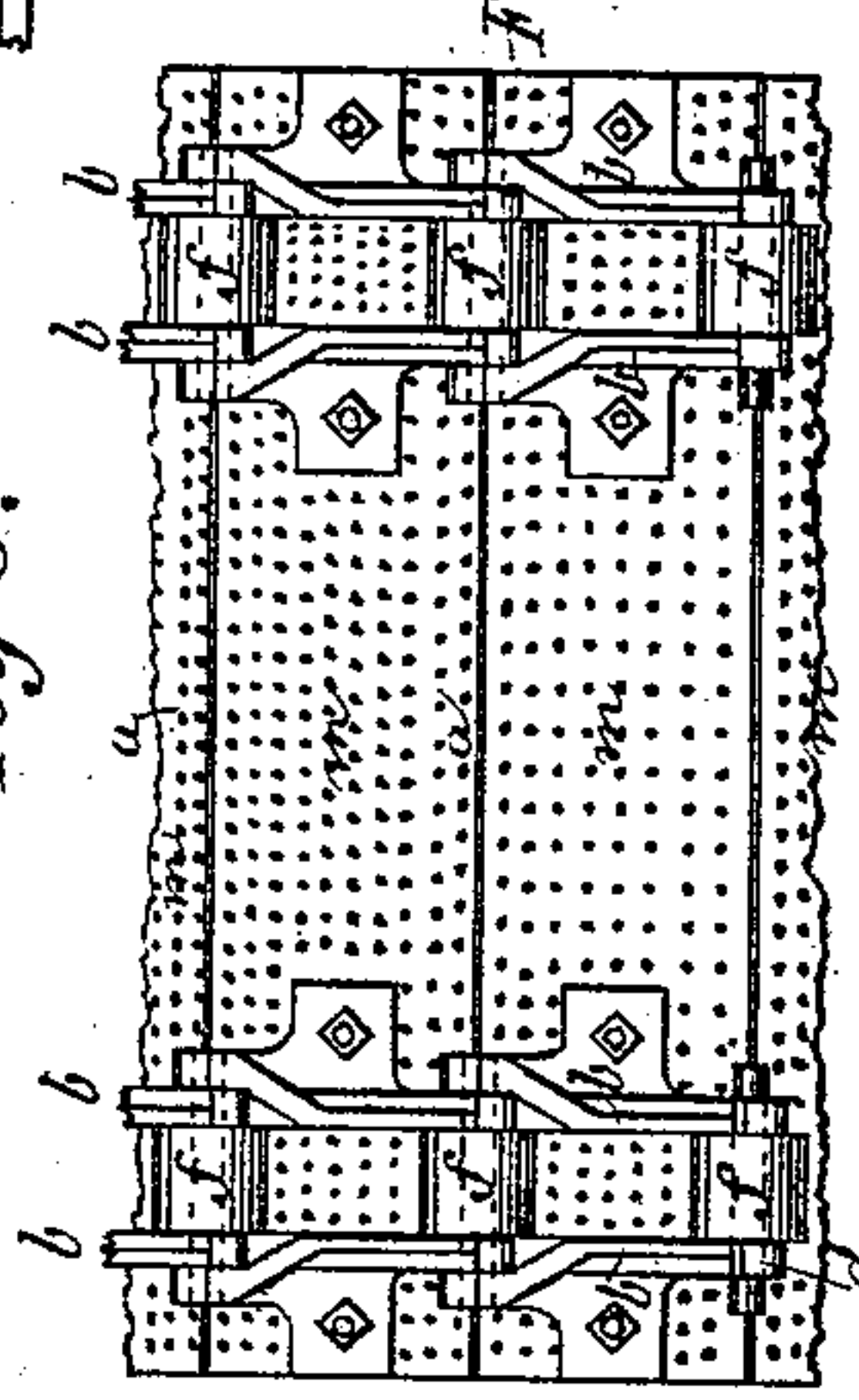
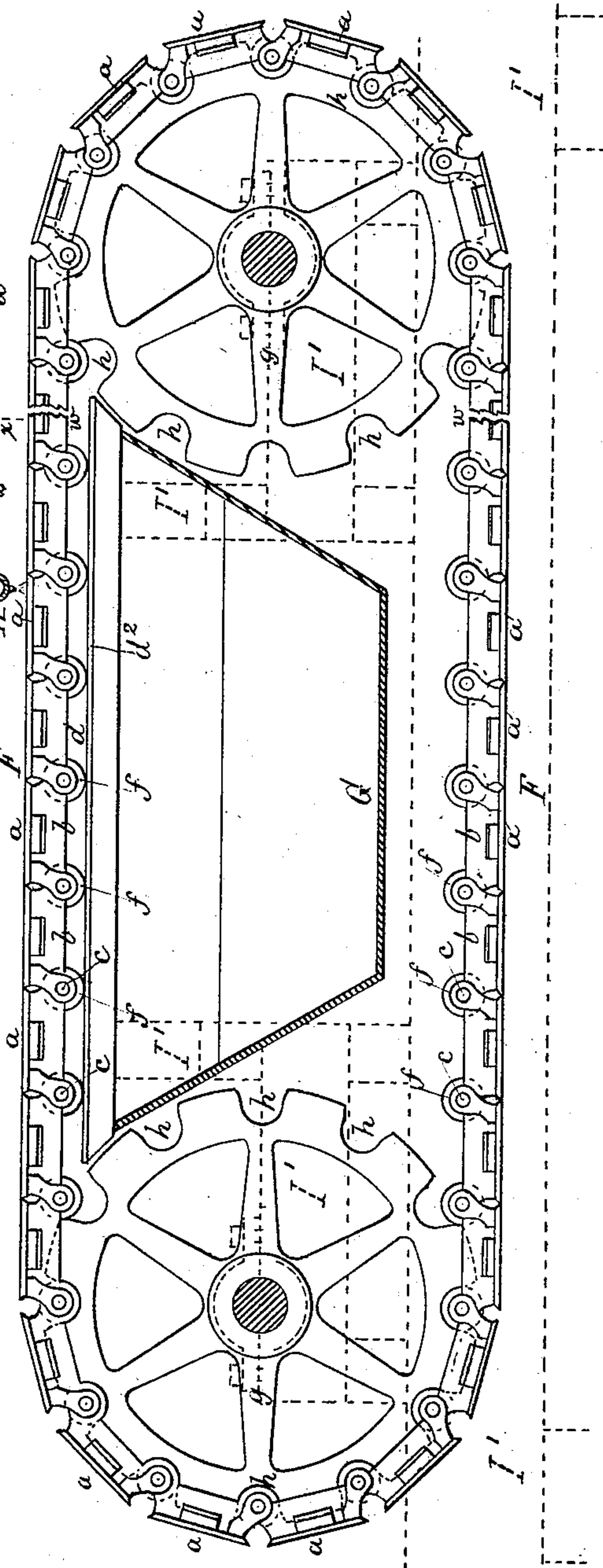


Fig. 3.

Fig. 2.



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UNITED STATES PATENT OFFICE.

WILLIAM A. MERRALLS, OF KANSAS CITY, MISSOURI.

CONVEYER AND SEPARATOR-APRON FOR MINING MACHINERY.

SPECIFICATION forming part of Letters Patent No. 449,942, dated April 7, 1891.

Application filed February 7, 1890. Serial No. 339,542. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. MERRALLS, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Conveyer and Separator Aprons for Mining Machinery and Similar Purposes; and I do hereby 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.

My invention is especially designed as an adjunct or attachment for the placer-mine apparatus for which Letters Patent No. 412,643, dated October 8, 1889, were granted to me; but it will be found useful for other descriptions of mining machinery, it being used as an endless-chain or a traveling "grizzly" and placed at the head of the sluice-box or as far to the head as will permit, so that the coarse rocks, gravel, or bowlders, or anything larger than the openings in the slats of the apron will be carried off and dumped in the most convenient place, thus doing away with the men who are kept constantly jerking out these larger substances.

The invention consists in certain novel constructions, combinations, and arrangements in an endless-chain apron or grizzly of mining machinery and in a novel combination and arrangement of the apron or grizzly comprising, in combination, the novel parts hereinafter described, with a concentrator and a water-distributing pipe above and between the ends of the apron or grizzly.

In the accompanying drawings, Figure 1 is a top view of my invention and a portion of the frame, screens, and lateral sluiceways, shafting, and gearing shown in my aforesaid Letters Patent. Fig. 2 is a transverse section in the line $x x$ of Fig. 1, looking in the direction of the supply end of the concentrating apparatus, the supply-gutter being omitted in the view. Fig. 3 is a detail inverted plan view of an upper portion of the endless-chain or slatted-apron conveyer. Fig. 4 is an end elevation of a modified construction of the conveyer and separator, looking toward the supply end of the apparatus.

A A A in the drawings represent revolving screens; A' A' A', semi-cylindrical concaves beneath the screens; B B', spouts and lateral

sluiceways; D, supporting-frame; C, shaft, and E gears, the same operating in a similar manner as in my aforesaid patent. Instead of these screens and sluiceways, any other suitable ordinary concentrator may be adopted for receiving the partly-screened substances from my conveyer and separator and subjecting the same to the finishing concentrating operation. The parts named, except the conveyer and separator, are not specifically claimed under this application.

F is an endless-chain apron conveyer and separator; G, an inclined receiving, discharging, and directing chute arranged partly within the conveyer F; H, a water-distributing pipe perforated with small holes and arranged about six inches above the apron-slats; H', an inclined supply spout or gutter arranged above the top of the sluiceways, and I supporting and bearing standards of a suitable platform or frame I', which frame is indicated by dotted lines.

The conveyer and separator-apron or grizzly may be arranged preferably at right angles, or nearly so, to the screens A and sustained, as shown, by the standards I and frame I', and its chute G may be applied either centrally beneath the upper portion of the apron, as in Fig. 1, or to one side of the center thereof, as shown in Fig. 4. The slats a of the apron are firmly fastened to chain-links b , which are united by joint-pins c and form endless chains d , the rollers f of which ride on ordinary supporting-ledges d^2 , supported by the frame I', all in the ordinary manner or as illustrated in Figs. 1, 2, and 3, or they may be fastened to ordinary endless chains d' , as in Fig. 4. When the chains are formed of links, as in Figs. 2 and 3, rollers, as f , are applied on each joint-pin c , and supporting-ledges, as d^2 , and chain-driving wheels g , with notches h in their peripheries for the reception of the rollers f , are provided for supporting and driving the chains; but when endless chains, as d' , are adopted sprocket-wheels g' are employed. The slats a of the apron are perforated, as at m , over the whole or nearly the whole of their surfaces, the perforations being one-sixteenth of an inch in diameter or of greater or less size, as circumstances require, said perforations extending entirely through the slats, so as to discharge substances through the apron upon the chute G,

and thereby enable said chute to conduct these substances into or upon a screen A or other suitable screen or sieve of a concentrator. The apron F is driven or revolved by means of gears E' and a shaft K or otherwise suitably, and it may be revolved either to the right or left of the concentrator by applying the gearing appropriately.

It will be seen from the foregoing description that the placer-mine gold-carrying substances, comprising gold, sand, dirt, and gravel, or boulders and water, are flowed or deposited from the spout or gutter H' upon an intermediate portion of the apron F, as illustrated, and while carried along by the apron, subjected, if necessary, to the action of an additional stream of water through perforated pipe H, they are agitated and disintegrated, and such portions of the mixture as are capable of passing through the perforations *m* of the slats fall upon the chute G and enter the first one of the screens A, wherein the gold is finally concentrated, and while this is going on the refuse, such as gravel and heavy boulders and the like, passes along the top of the apron and discharges at one or the other end thereof upon the "dump," and as one quantity is separated another is taking its place and being treated in like manner as at the start. By my invention the concentrator is saved from the injurious wear resulting from heavy boulders and large masses of refuse matter passing longitudinally through the screens or over sieves during the concentrating operation, the labor of men jerking out large boulders saved, and the operation is very effectively performed. In Fig. 4 the apron is shown with an intermediate chain or sprocket wheel *g*², and the chute is between this wheel and an end wheel. If desirable, another chute may be applied in space *x' x'*, and the two branch chutes unite in one connection-tail or discharging-chute leading into the concentrator.

It is sometimes necessary to use an apron or grizzly one or two hundred or a thousand feet in length, or to have one end of the apron one thousand feet above the first concentrator-screen, and in such case the proportions and arrangement of the parts will have to be changed accordingly, and a greater number of chain-driving supporting-wheels running on suitable ledges *d*² will have to be provided; but the discharging chute or chutes, as G, will be applied partly within the apron, as described and shown.

The breaks at *w w'* in the drawings are intended to indicate that the apron and chute G may be of any desired length, so as to be adapted for use with concentrating machinery.

From the foregoing specification it will be seen that my invention is an improvement of means for facilitating the conveyance of mining material from the place of deposit to a concentrator, and in its passage effecting a separation of the gold and precious metals

from boulders and rocks, and that said material is received from the sluice-box separated at the point where the concentrator is located by the agitating motion of the grizzly or endless-chain slatted perforated apron and the action of a stream of water from a pipe above the apron and in close proximity to the discharging end of the supply pipe or gutter, which is at right angles to the grizzly or apron, and that this separation is so effected that the gold or other precious metal and sand and small gravel descend through the apron or grizzly into a chute which is also at right angles to the apron or grizzly, and therefrom passed and discharged into the concentrator, while the boulders, rocks, or other large debris are conveyed along upon the grizzly and dumped at the end of the same upon the "heap" or into other receptacles beyond the end of the apron or grizzly, and that during this operation such substances as cling to the boulders or pieces of rock, and consequently do not pass off at once through the holes in the slats of the apron or grizzly, are subjected to the forcible washing action of water from the distributing-pipe, and thereby separated from the same and compelled to pass through the openings in the slats before the boulders or rocks have passed beyond the range of the receiving, discharging, and directing chute, which conveys the partly-screened substances into the concentrator.

What I claim is—

1. In a mining-machine grizzly or apron, in combination, the transversely-arranged conveying and separating apron, the receiving, discharging, and conducting chute supported within and extending from the inside of the apron a suitable distance, the longitudinally-arranged supply pipe or gutter above the apron, the water-distributing pipe located above the apron and chute and in close proximity to the supply-gutter and between the ends of the apron, and the longitudinally-arranged concentrating screens or sieves adapted for receiving the partly-separated substances from the said receiving and conducting chute at a point between the ends of the apron, substantially as described.

2. In a grizzly or apron for conveying or separating gold and precious metals from boulders and rock in the passage of the same from the mine or place of deposit to the concentrator, the combination of the endless chain, perforated slatted conveyer and separator, a chute leading out of it between its ends, a longitudinally-arranged supply pipe or gutter above the apron, and a water-distributing pipe H, arranged above and between the ends of the grizzly or apron, substantially as described.

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

WILLIAM A. MERRALLS.

Witnesses:

ROLLINS BINGHAM,
L. G. FARWELL.