

April 21, 1925

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E. O'TOOLE

MINING MACHINE

Original Filed Feb. 20, 1923

2 Sheets-Sheet 1

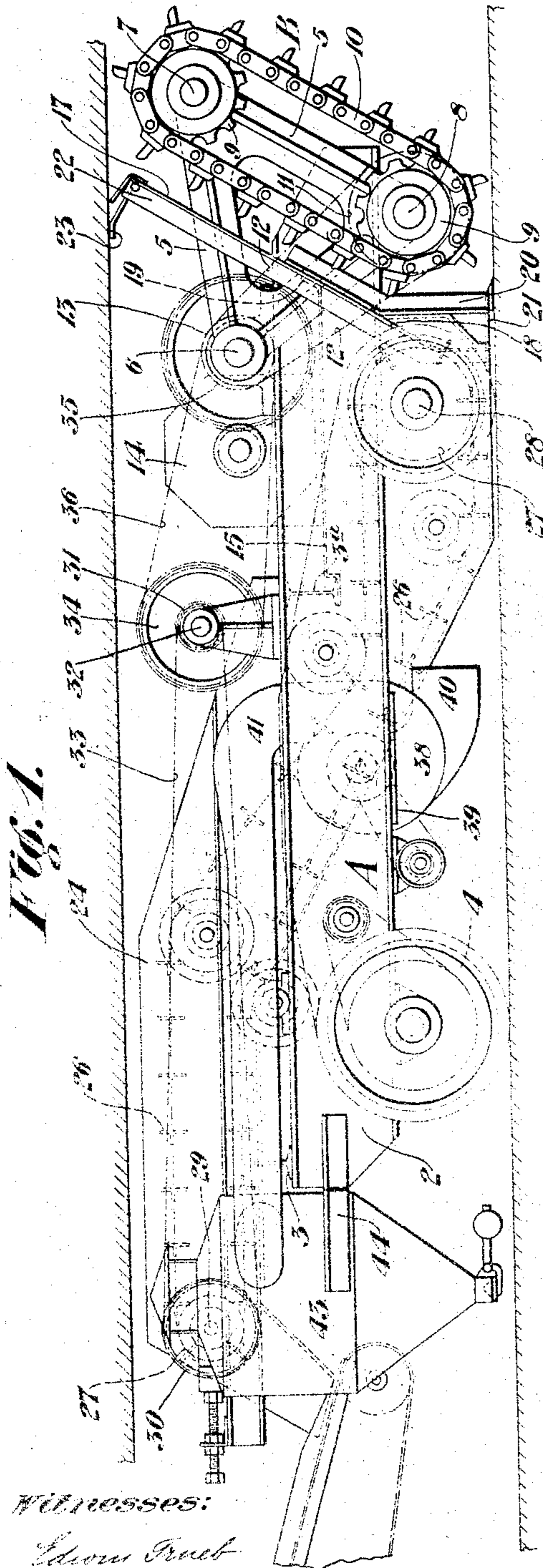


Fig. 1.

Witnesses:
Edwin Pruet

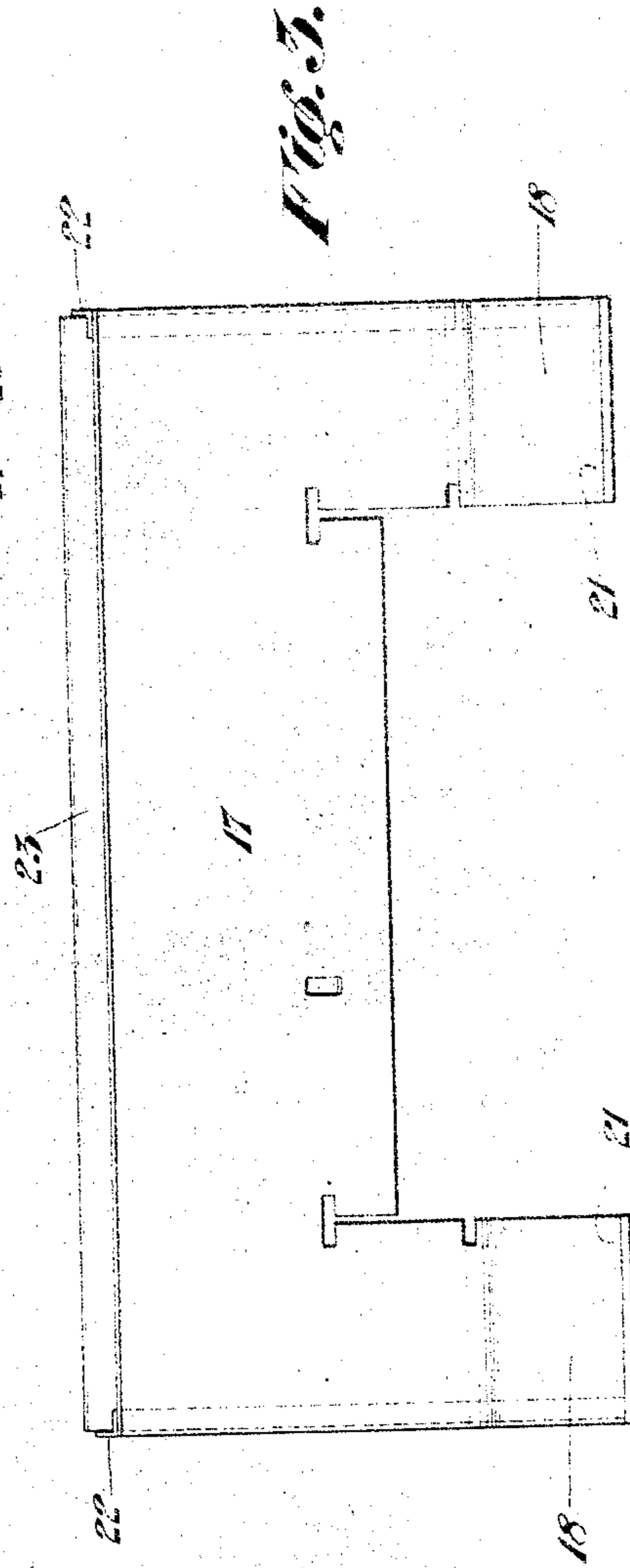


Fig. 2.

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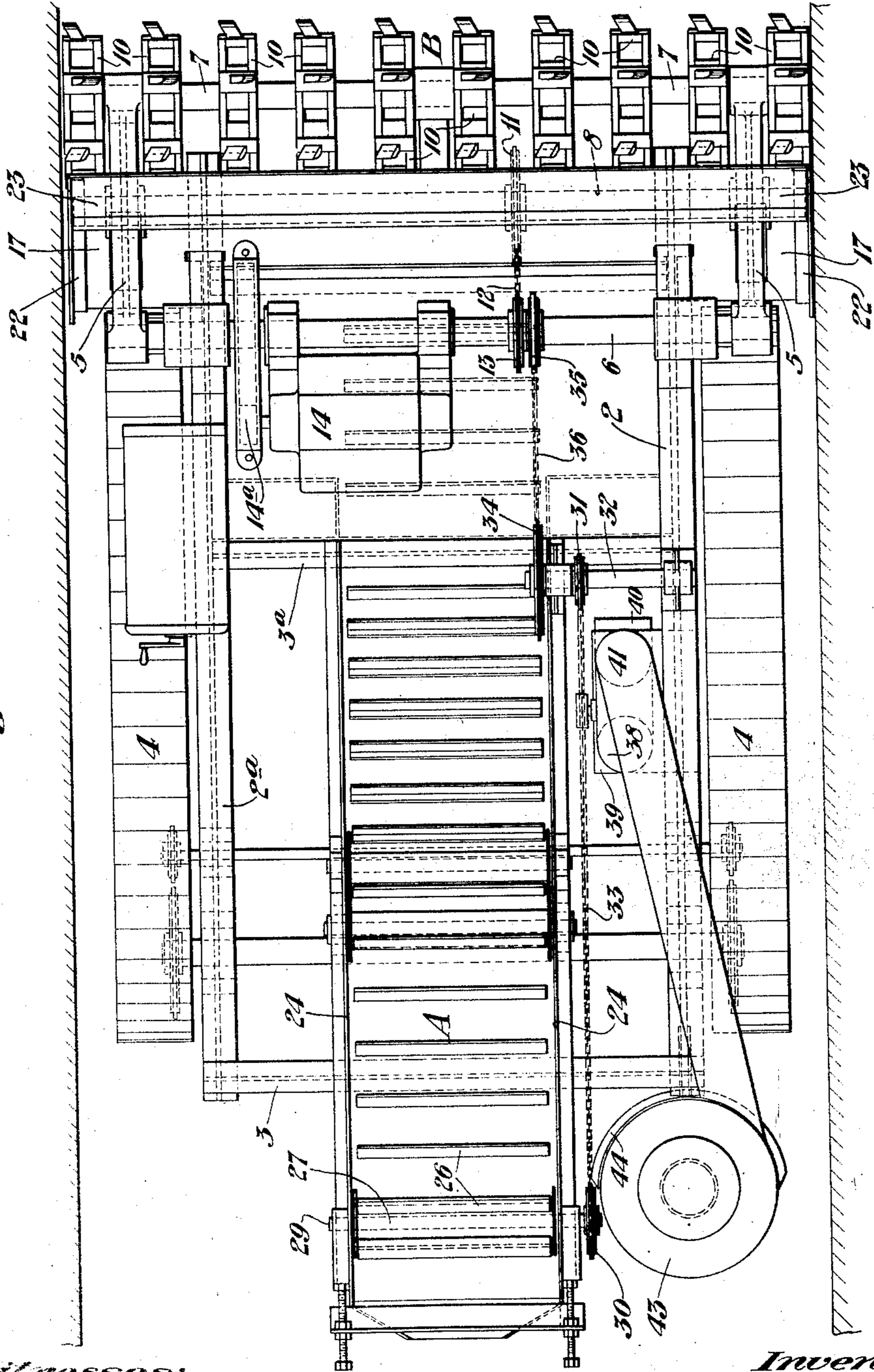
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2 Sheets-Sheet 2

Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

EDWARD O'TOOLE, OF GARY, WEST VIRGINIA.

MINING MACHINE.

Application filed February 20, 1923, Serial No. 620,247. Renewed October 8, 1924.

To all whom it may concern:

Be it known that I, EDWARD O'TOOLE, a citizen of the United States, and resident of Gary, in the county of McDowell and State of West Virginia, have invented certain new and useful Improvements in Mining Machines, of which the following is a specification.

This invention relates to mining machines and while not limited thereto relates more particularly to mining machines primarily used for driving headings, and has for one of its objects the provision of such a machine having means for preventing the cutting dust from spreading through the mine.

Another object is to provide a machine of this class having the novel construction, design, and combination of parts hereinafter described and illustrated in the following specification.

In the drawings—

Figure 1 is a side elevation of a machine embodying my invention.

Figure 2 is a top plan thereof.

Figure 3 is a front elevation of the head cover member.

Referring more particularly to the drawings, the letter A designates the main frame of the machine as a whole, which is composed of side members 2—2^a, end members 3, and forward transverse member 3^a. The frame A is mounted on a caterpillar base 4 of standard design.

A cutter head B is positioned at the forward end of the machine and comprises triangular head members 5 mounted on shaft 6 and having shafts 7 and 8 journaled therein for carrying the cutter chain sprockets 9. The sprockets 9 are spaced at equal distances along the shafts 7 and 8 and have cutter chains 10 trained thereover.

The bottom cutter chain sprocket shaft 8 is the driven shaft, and is provided with a sprocket 11 which is connected by a sprocket drive chain 12 with a sprocket 13 on the shaft 6, which serves as the main drive shaft of the machine and is connected by suitable gearing in housing 14^a with a motor 14 supported on a cover platform member 15 arranged between the side members 2 of the frame A.

The cover platform member 15 has its rear end secured to the transverse beam member 3^a arranged between the side members 2, and its forward end secured to an

inclined head cover member 17 arranged to the rear of the cutter head B.

The head cover member 17 is composed of a plate member cut away at its bottom edge to form leg portions 18 extending downwardly outside of each of the side members 2 of the frame, and its cutaway portion extends between the side members 2, and the lower edge of this portion is secured to the upturned forward edge 19 of the platform cover member 15.

The head cover is secured to angle brackets 20 extending upwardly from the bottom plate 21 of the machine.

The head cover member 17 is provided with stiffening and reinforcing angles 22 along its side edges, and is also provided with a flexible contacting or sealing strip 23 along its upper edge adapted to engage the irregular surface of the mine roof.

Suitable skirt or side plates 24 are arranged between the side members 2 and a suitable endless conveyer is arranged between the side plates 24 and adapted to convey the mined material from the cutter head B rearwardly of the machine and deliver it into other suitable means such as conveyers, mine cars, etc.

The conveyer comprises an endless scraper conveyer member 26 trained over suitable sprockets 27 on shafts 28 and 29. The shaft 29 is the driven shaft and is provided with a power sprocket 30 connected to a sprocket 31 on a counter-shaft 32 by a chain 33. The counter-shaft 32 receives its power through a sprocket 34 connected to a sprocket 35 on the main drive shaft 6 by a chain 36.

An exhaust fan 38 is mounted on suitable brackets 39 secured to the side frame member 2. The fan 38 may be of any desired standard design and is adapted to have its inlet 40 directed toward the front of the machine and its outlet 41 directed rearwardly and entered tangentially into a dust collector 43 of standard design secured to bracket arms 44 carried by the side member 2 of the main frame.

In operation the cutter head B will cut down the coal, and the coal will be forced onto the conveyer which will carry it rearwardly of the machine.

During the operation of the machine a large quantity of fine dust is formed, especially by the cutting operation of the head

B. Heretofore this dust has been permitted to enter the air currents of the mine and created a dangerous condition, since such dust laden air was subject to explosion.

5 However, in the present machine, the cover members 15 and 17 prevent the major portion of the dust from the head cutting operation escaping and, therefore, it is caused to settle into the coal. Any dust that does
10 escape around the cover members 15 and 17 or is caused by the conveying mechanism and other parts of the machine, is removed from the air in the immediate vicinity of the machine by the operation of the fan
15 38 and dust collector 43.

The fan 38 draws the dust laden air from around the machine and forces it into the dust collector 43 where the dust is removed and the air escapes back into the
20 mine. Thus the air in the immediate vicinity of the machine is continually circulated and cleaned and substantially all dust created by the machine is prevented from escaping into the regular air currents of the
25 mine.

It will be understood that the dust cover and air circulating and dust collecting means of this invention may be used with other mining machines employing cutter
30 heads other than the specific design shown, by slightly modifying the design of the cover, and, therefore, I do not wish to be limited to the specific design and combination of parts shown since various modifications may be made without departing from
35 the scope of my invention as defined in the appended claims.

I claim—

40 1. The combination with a mining machine comprising a main frame, a cutter head, a conveyer for the cut material, and means for operating said conveyer and said cutter head, of a cover member arranged to the rear of said cutter head and extending
45 between the roof and floor of said mine at each side of said main frame and from the roof downwardly to a point above said conveyer, between the side members of said main frame, and then rearwardly over said
50 conveyer for an appreciable distance, and means for causing a circulation of the air

in the immediate vicinity of said machine and for removing the dust therefrom.

2. The combination with a mining machine comprising a main frame, a cutter head, a conveyer for the cut material, and means for operating said conveyer and said cutter head, of a cover member arranged to the rear of said cutter head and extending between the roof and floor of said mine at each side of said main frame and from the roof downwardly to a point above said conveyer between the side members of said main frame and then rearwardly over said conveyer for an appreciable distance.

3. The combination with a mining machine comprising a main frame, a cutter head, a conveyer for the cut material, and means for operating said conveyer and said cutter head, of a cover member arranged to the rear of said cutter head and extending between the roof and floor of said mine at each side of said main frame and from the roof downwardly to a point above said conveyer between the side members of said main frame and then rearwardly over said conveyer for an appreciable distance, and a strip of flexible material mounted along the upper edge of said cover adapted to adjust itself to the irregular roof surface.

4. The combination with a mining machine comprising a main frame, a cutter head, a conveyer for the cut material, and means for operating said conveyer and said cutter head, of a cover member arranged to the rear of said cutter head and extending between the roof and floor of said mine at each side of said main frame and from the roof downwardly to a point above said conveyer between the side members of said main frame and then rearwardly over said conveyer for an appreciable distance, a strip of yieldable material along the upper edge of said cover adapted to adjust itself to the irregular roof surface, and means for causing a circulation of the air in the immediate vicinity of said machine and for removing the dust therefrom.

In testimony whereof I have hereunto set my hand.

EDWARD O'TOOLE.