

May 27, 1924.

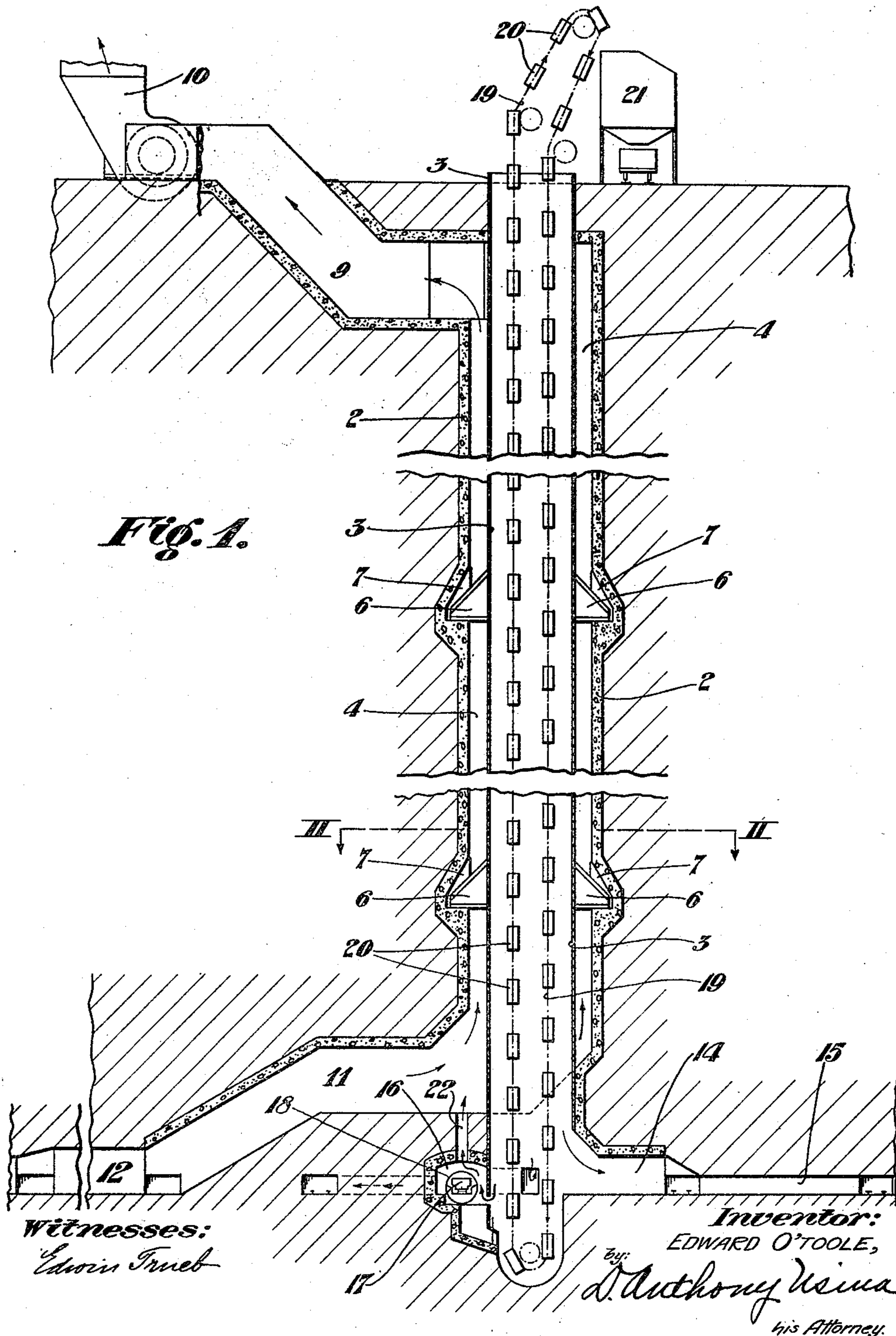
1,495,352

E. O'TOOLE

MINE SHAFT

Filed Feb. 20, 1923

2 Sheets-Sheet 1



**Fig. 1.**

Witnesses:  
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EDWARD O'TOOLE,

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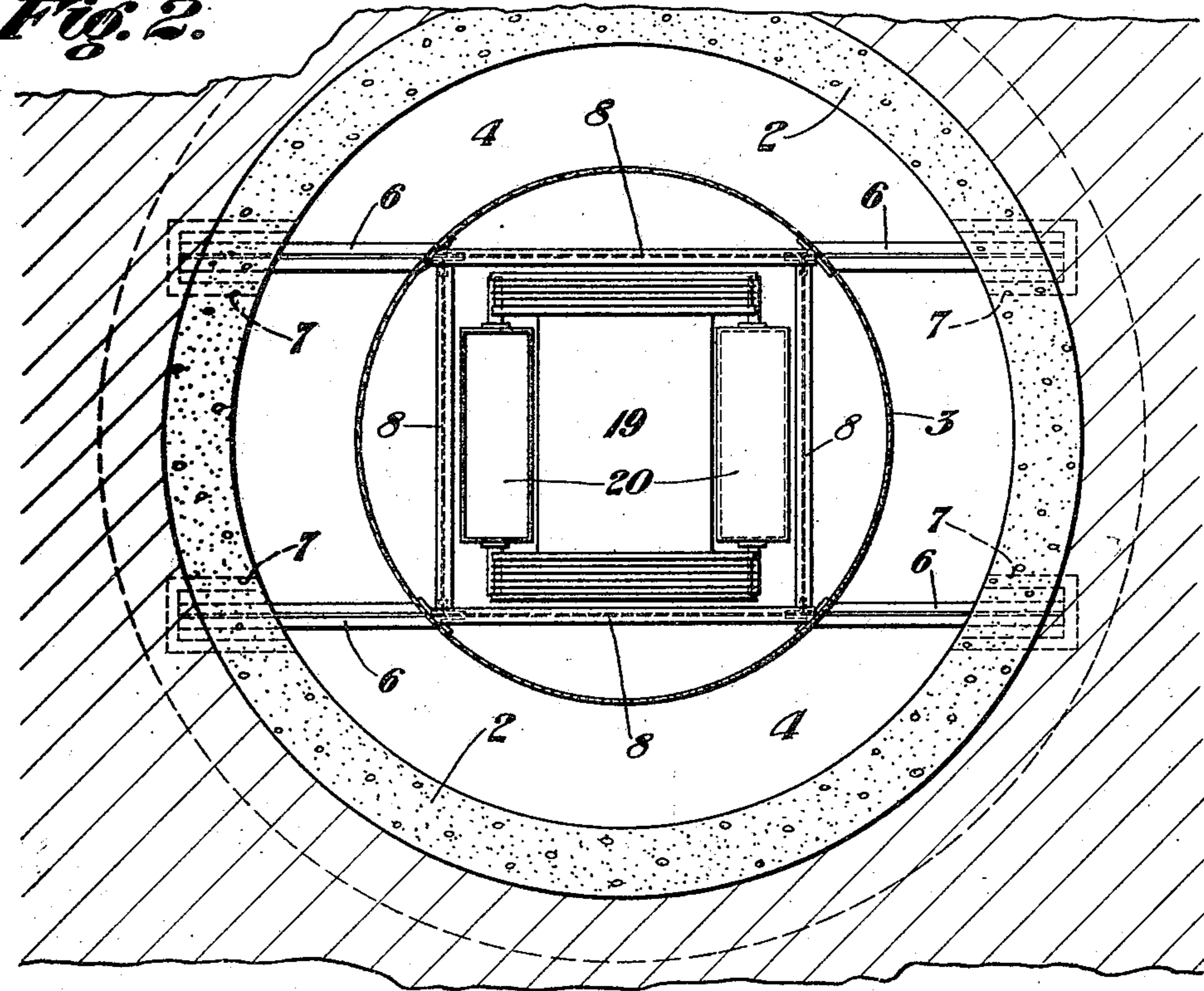
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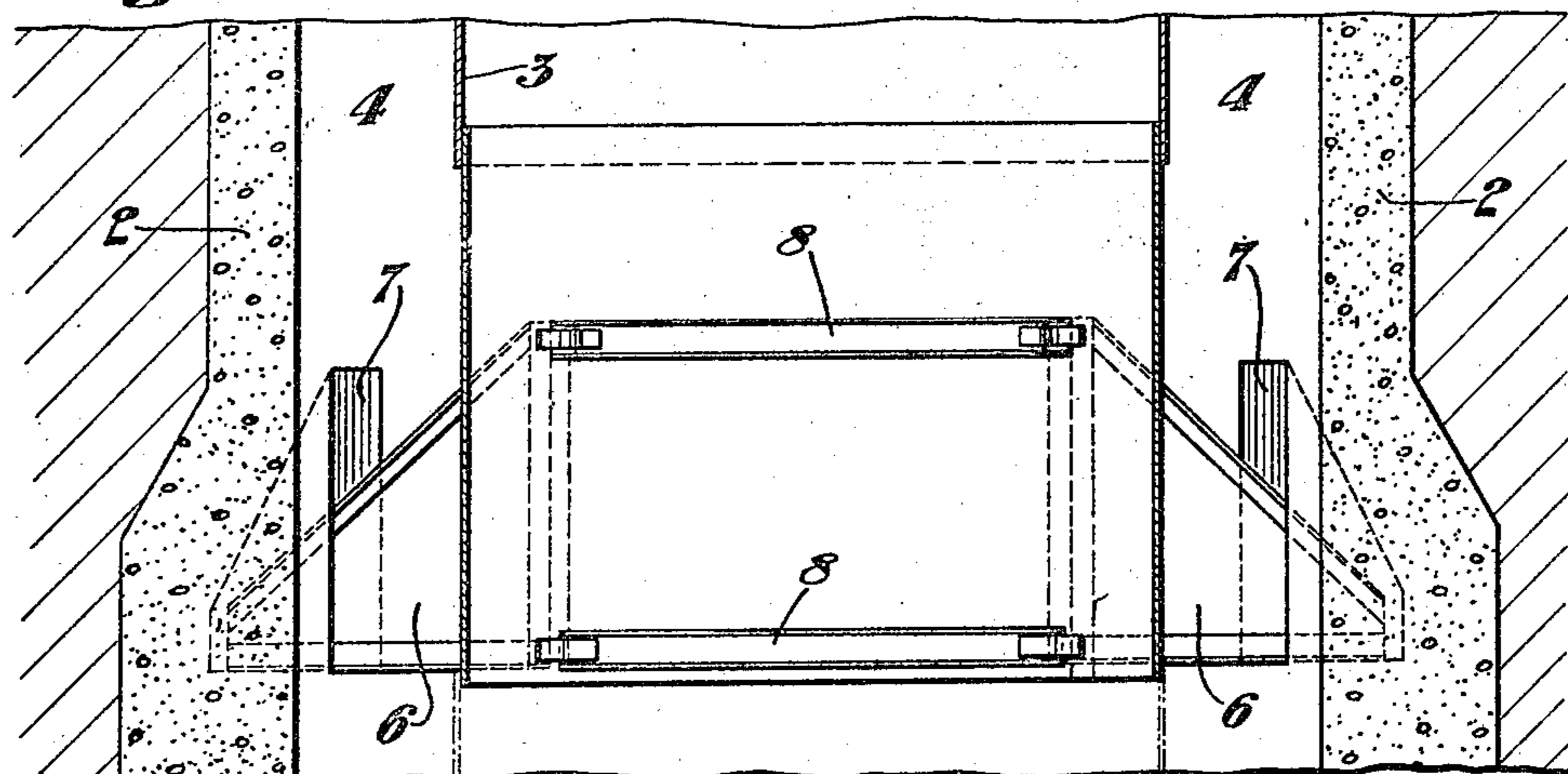
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**FIG. 2.**



**FIG. 3.**



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# UNITED STATES PATENT OFFICE.

EDWARD O'TOOLE, OF GARY, WEST VIRGINIA.

MINE SHAFT.

Application filed February 20, 1923. Serial No. 620,248.

*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 Mine Shafts, of which the following is a specification.

This invention relates to mine shafts and more particularly to a combined air and haulage shaft and has for its principal object the provision of a shaft in which in-going and out-going air will pass through separate compartments.

Another object is to provide a shaft that will not be subject to freezing during the cold weather.

A further object is to provide a shaft having the novel construction and combination of parts described in the following specification and illustrated in the accompanying drawings.

In the drawings—

Figure 1 is a vertical sectional elevation through a shaft constructed in accordance with this invention.

Figure 2 is an enlarged transverse sectional view on the line II—II of Figure 1.

Figure 3 is a typical section through a support portion of the shaft.

Referring more particularly to the drawings, the numeral 2 designates the outer cylindrical concrete wall of the shaft which is built directly against the ground wall. A cylindrical or tubular metal shell member 3 is arranged centrally within the shaft and spaced away from the concrete wall 2, forming an air passage space 4.

The shell 3 is supported in spaced relation from the wall 2 by brace members 6 mounted in offsets 7 in the wall 2 and secured to the side walls of the shell 3.

At points directly opposite the supports 6, the shell 3 is provided with compression braces 8 to prevent collapsing of the shell.

An air outlet or exhaust conduit 9 is provided at the upper end of the shaft and communicates with the upper end of the space or passage 4 and an exhaust fan 10.

An exhaust or return air inlet conduit or passage 11 is provided at the bottom of the shaft which communicates with the return air heading 12 of the mine and the lower end of the passage 4.

A fresh air inlet conduit 14 is provided at the lower end of the shaft and communi-

cates with the lower end of the shell 3 and the fresh air heading 15 of the mine.

It will be readily understood from the above that the dust laden or foul and warm air from the mine is drawn from the mine through conduit or passage 11 and up through the passage 4 between the wall 2 and shell 3 by the fan 10 while the fresh cold air flows in through the shell 3 and conduit 14 to the mine. By thus conducting the warm exhaust air up between the shell 3 and wall 2 freezing of water seeping into the shaft is prevented and the shaft is kept unobstructed during the coldest weather.

A loading pit 16 is formed at the end of the shaft onto which the mined material is dumped from the mine cars 17 by an automatic dumping mechanism 18, which is preferably of the form shown in my co-pending application, Serial No. 594,446, filed October 14, 1922.

An endless conveyor 19 is mounted within the shell 3 and is provided with buckets adapted to receive the mined material from the pit 16 and convey it up through the shell 3 and discharge it into a suitable bin or hopper 21 at the upper end of the shaft.

In order to prevent the dust, caused by dumping the mined material, from flowing back into the mine with the fresh air, a bleeder passage or conduit 22 is formed which communicates with the space directly above the dumping mechanism 18 and with the exhaust air conduit 11 so as to exhaust the dust laden air direct from this point.

I claim—

1. The combination with a mine, of a shaft comprising an outer surrounding wall portion, and an inner tubular member arranged centrally and extending the full length of said shaft, means for supporting and spacing said inner tubular member from said outer wall, an air outlet conduit from the mine communicating with the space between said inner tubular member and said outer wall at the lower end of said shaft, and an air inlet conduit to the mine communicating with the interior of said inner tubular member at the lower end of said shaft.

2. A mine shaft comprising an outer surrounding concrete wall built directly against the ground walls of the shaft, a metallic shell member extending the full length of said shaft and spaced a material distance

from said concrete wall, means for supporting and spacing said shell from said concrete wall, means at the upper end of said shaft communicating with the space between  
 5 said shell member and the outer wall of said shaft for exhausting air from said mine, an air outlet conduit from the mine communicating with the space between said shell and  
 10 the outer wall of said shaft at the lower end of said shaft, and an air inlet conduit to the mine communicating with the interior of said shell member at the lower end of  
 15 said shaft, whereby fresh cold air is drawn through said shell and the warm exhaust air from the mine is drawn upward through the space between said shell and concrete shaft wall.

3. A cylindrical mine shaft comprising an outer surrounding concrete wall built  
 20 directly against the ground walls of the shaft, a metallic cylindrical shell member extending the full length of said shaft and spaced a material distance from said concrete wall, means for supporting and spacing  
 25 said shell from said concrete wall, an exhaust conduit communicating with the space between said shell and said concrete shaft wall, an exhaust fan communicating with the outer end of said conduit for exhausting  
 30 air from the mine, an air outlet conduit from the mine communicating with the space between said shell and the outer wall of said shaft at the lower end of said shaft; and an air inlet conduit to the mine  
 35 communicating with the interior of said shell member at the lower end of said shaft, whereby fresh cold air is drawn through said shell and the warm exhaust air from the mine is drawn upward through the space  
 40 between said shell and concrete shaft wall.

4. A mine shaft comprising an outer surrounding concrete wall built directly against the ground walls of the shaft, a metallic shell member extending the full length of  
 45 said shaft and spaced a material distance from said concrete wall, means for support-

ing and spacing said shell from said concrete wall, means for conveying mined material through said shell, an exhaust conduit  
 50 communicating with the space between said shell and said concrete shaft wall, an exhaust fan communicating with the outer end of said conduit for exhausting air from the mine, an air outlet conduit from the mine  
 55 communicating with the space between said shell and the outer wall of said shaft at the lower end of said shaft, and an air inlet conduit to the mine communicating with the interior of said shell member at the  
 60 lower end of said shaft, whereby fresh cold air is drawn through said shell and the warm exhaust air from the mine is drawn upward through the space between said shell and concrete shaft wall.

5. A cylindrical mine shaft comprising an  
 65 outer surrounding concrete wall built directly against the ground walls of the shaft, a metallic cylindrical shell member extending the full length of said shaft and spaced a material distance from said concrete wall, means for supporting and spacing  
 70 said shell from said concrete wall, means at the upper end of said shaft communicating with the space between said shell member and the outer wall of said shaft for exhausting air  
 75 from said mine, an air outlet conduit from the mine communicating with the space between said shell and the outer wall of said shaft at the lower end of said shaft, and an air inlet conduit to the mine communicating  
 80 with the interior of said shell member at the lower end of said shaft, whereby fresh cold air is drawn through said shell and the warm exhaust air from the mine is drawn upward through the space between said shell  
 85 and concrete shaft wall, and means for bleeding a small quantity of air from the lower end of said shell into said outlet conduit to remove dust laden air therefrom.

In testimony whereof I have hereunto set  
 my hand.

EDWARD O'TOOLE.