

[54] **ACOUSTIC METHOD AND APPARATUS FOR DETERMINING EFFECTIVENESS OF MINE PASSAGE SEAL**

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[57]

**ABSTRACT**

The effectiveness of a seal for extinguishing fires in an underground mine passage is determined by transmitting acoustic energy from a first site toward the seal. The acoustic energy is detected at a second site on the opposite side of the seal from the transmitting site. To provide for remote monitoring of the seal, acoustic transmitter and receiver means are lowered into the passage to the first and second sites through vertical bores. The effectiveness of the seal is determined by the amplitude of the detected acoustic energy. The size of any hole in the seal is determined by comparing the amplitude of the detected energy after the seal has been started and prior to the sealing operation commencing. The acoustic energy has a carrier frequency that randomly varies over a relatively broad band to prevent acoustic nodes in the passageway. The carrier frequency is varied between approximately 500 KHz and 4,000 KHz to enable the energy to be somewhat directional in the passage and to have a relatively uniform field in the passage downstream of the seal. To provide a relatively high signal-to-noise ratio and effectively preclude detection of energy arriving at a receiver by way of flanking paths, the acoustic energy is pulsed and the receiver is gated on only during a time interval when it is expected that the pulse will be received at the second site via the passage.

**15 Claims, 5 Drawing Figures**

