

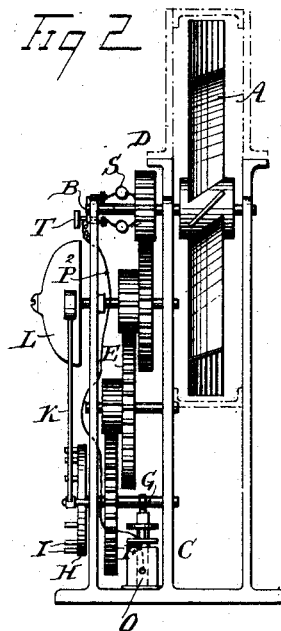
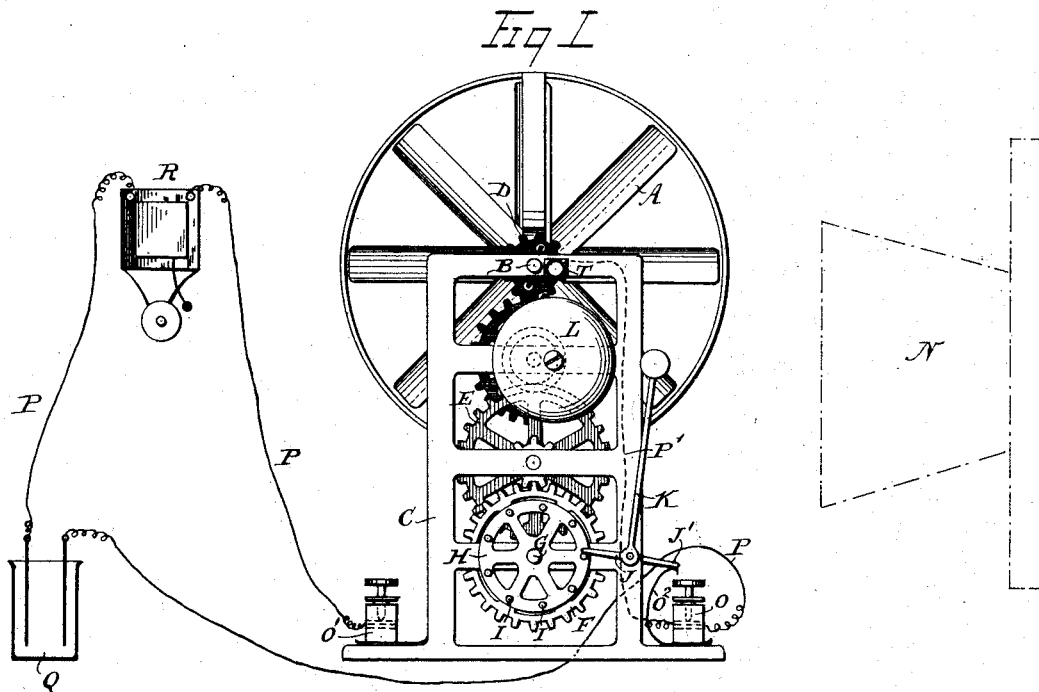
(No Model.)

2 Sheets—Sheet 1.

W. BULLUCK.  
DRAFT ANNUNCIATOR FOR MINES.

No. 419,312.

Patented Jan. 14, 1890.



WITNESSES:

H. Walker  
C. Sedgwick

INVENTOR:

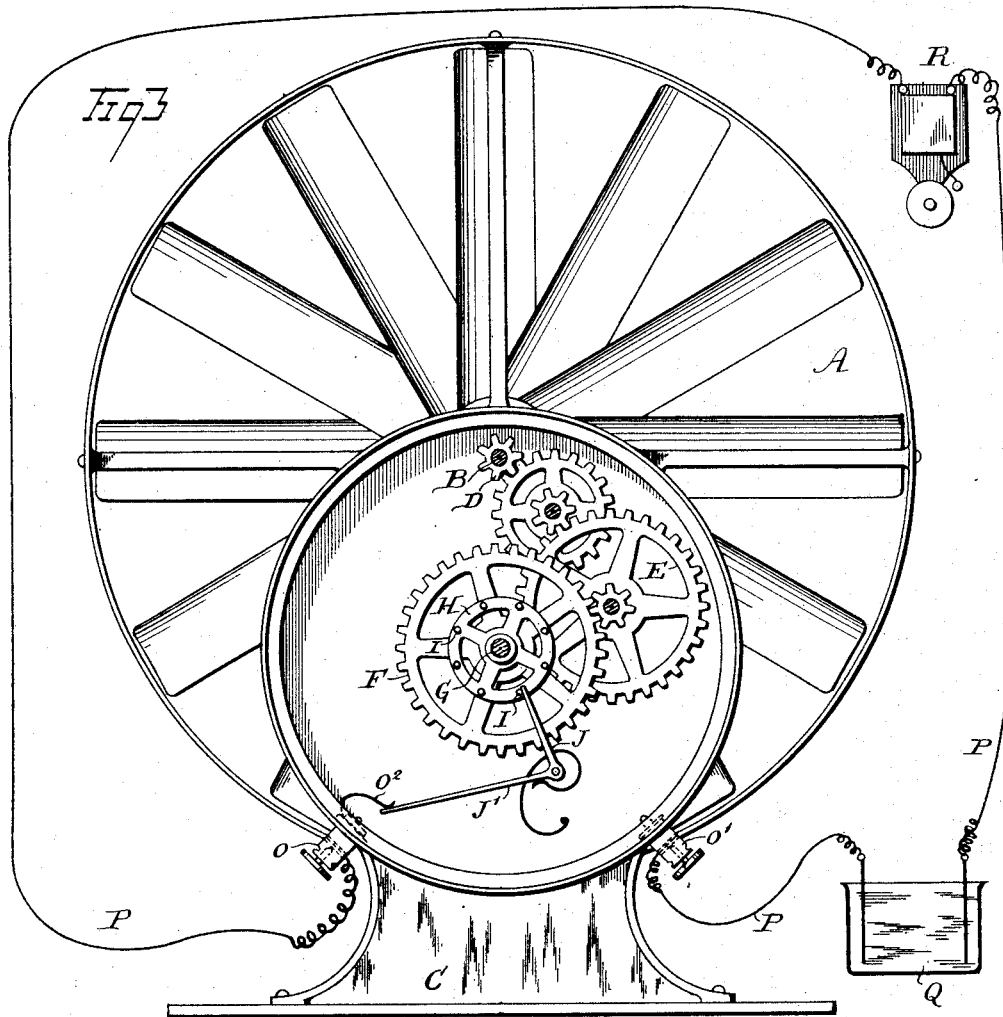
W. Bulluck  
BY: *Mum & Co.*

ATTORNEYS.

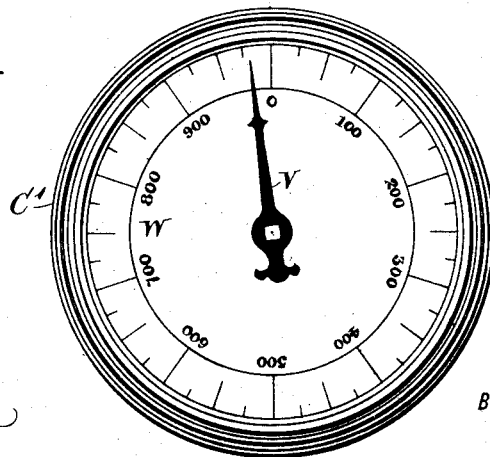
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*Fig 4*



WITNESSES:  
*H. Walker*  
*C. Sedgwick*

INVENTOR:  
*W. Bulluck*  
BY *Munn & Co*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

WILLIAM BULLUCK, OF CENTRALIA, PENNSYLVANIA.

## DRAFT-ANNUNCIATOR FOR MINES.

SPECIFICATION forming part of Letters Patent No. 419,312, dated January 14, 1890.

Application filed June 18, 1889. Serial No. 314,685. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM BULLUCK, of Centralia, in the county of Columbia and State of Pennsylvania, have invented a new and Improved Draft-Annunciator for Mines, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved annunciator which is simple and durable in construction and serves to indicate the state of the air in the return-airways of a mine.

The invention consists in certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front view of the improvement as connected with a telephone and electric bell. Fig. 2 is an end elevation of the same. Fig. 3 is a front view of the improvement connected with an electric bell of a different form. Fig. 4 is a face view of the cover for the same.

The improved annunciator is provided with a fan-wheel located in the return-airway of the mine and rotated by the current of air passing through the airway. In case the current of air is very strong, the fan-wheel rotates rapidly; but if a feeble current passes through the airway the fan-wheel is rotated slowly, and if no current exists the fan-wheel is not rotated at all. The rotating fan-wheel is connected by a suitable mechanism with a bell, which is sounded at intervals varying with the speed of the fan-wheel. The sounds of the bell are transmitted by a telephone to the central office located above ground, so that the foreman in the central office, hearing the sounds, can tell the state of the air in the respective airway in which the fan-wheel is located.

Instead of the fan-wheel being connected with the bell in the airway, it may be connected with a circuit-breaker of an electric bell which leads from the mine to the central office and sounds a bell there. The telephone can, by this arrangement, be entirely dispensed with.

As shown in the drawings, in Figs. 1, 2, and 3, the fan-wheel A, of any approved construction, is secured on a shaft B, mounted to turn in suitable bearings formed in a frame C, located in a suitable place in the return-airway in the mine. On the shaft B is secured a pinion D, connected with a train of gear-wheels E, of which the last gear-wheel F is secured on a shaft G, mounted to turn in suitable bearings on the frame C. On the front end of the shaft G is fastened a disk H, provided on its face with a number of pins I, arranged in a circle and adapted to operate successively on an arm J, extending from the striker K, adapted to sound a bell L, held on the frame C. In the immediate neighborhood of the bell L is held a telephone-transmitter N of a telephone connected with the central office located above ground and serving to transmit the sounds of the bell L to the central office.

When the air-current in the airway passes through the fan-wheel A, the latter is rotated, and by its connection with the train of gear-wheels E turns the disk-wheel H, which, by its pins I, actuates the striker K, sounding the bell. According to the speed of the fan-wheel A the striker K sounds the bell at intervals varying with the speed of the said fan-wheel. The operator in the central office, hearing the sounds through the telephone, can tell the state of the air in the mine.

Instead of using a telephone, as described, I may dispense with the same and the bell L on the frame C, and employ an electric bell of any approved construction, such as shown in the drawings.

In Figs. 1, 2, and 3 the striker-arm J is provided with a spring-pressed extension J', moved in and out of contact with the spring O<sup>2</sup>, connected with the post O, held insulated on the frame C, and from which leads a circuit-wire P, connected with a battery Q and an annunciator R, preferably located in a central office outside of the mine. The wire P is also connected with a post O', held directly on the frame C. Now, when the fan-wheel A rotates the electric circuit is alternately closed and opened by the extension J', engaging and disengaging the spring O<sup>2</sup>; consequently the bell of the annunciator is sounded at intervals varying with the speed of the

fan-wheel. To this device I may add a spring-governor circuit-breaker. (Shown in Figs. 1 and 2.) The governor S is attached to the main shaft B, and when the wheel A runs at a normal rate of speed the governor is disconnected from the screw T, held insulated in the frame C and connected by a branch wire P' with the insulated post O, previously described. Now, when the fan-wheel A runs very slow, (indicating an insufficient quantity of air in the airway,) then the governor connects with the screw T and completes the electric circuit, so that the bell of the annunciator sounds continuously, thus giving an alarm, which indicates insufficient or foul air in the airway of the mine. On the square end of the shaft G may be secured a hand V, (see Fig. 4,) indicating on a dial W, held in a cover C', fitting on the casing C. The hand indicates the amount of air passing through the wheel A at a given time.

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

25 1. In a draft-annunciator, the combination, with the fan-wheel located in a mine-airway and adapted to be rotated by the air in the same, of an electric bell, a circuit-breaker,

means for operating the circuit-breaker from the fan-wheel, circuit-wires, a spring-governor operated by the fan-wheel, and contacts with which the governor engages, substantially as described, whereby provision is made for sounding the bell at intervals varying with the speed of the fan-wheel, and also for sounding the bell continuously when the fan-wheel slackens below a certain speed, as set forth.

2. In a draft-annunciator, the combination, with a fan-wheel located in and operated by the current of air in a mine-airway, of an electric bell, a disk provided with a series of pins, means for operating the disk from the fan-wheel, a pivoted arm projecting into the path of the pins of the disk, a contact-spring engaging said arm, a spring-governor on the shaft of the fan-wheel and operated by the movement of the said fan-wheel, a contact-screw with which the governor engages, and circuit-wires, substantially as herein shown and described.

WILLIAM BULLUCK.

Witnesses:

W. K. LORD,  
L. E. DAVIS.