E. DAVIS.

Blast-Furnace Alarm Apparatus.

No. 139,300. Patented May 27, 1873.

Fig. 3

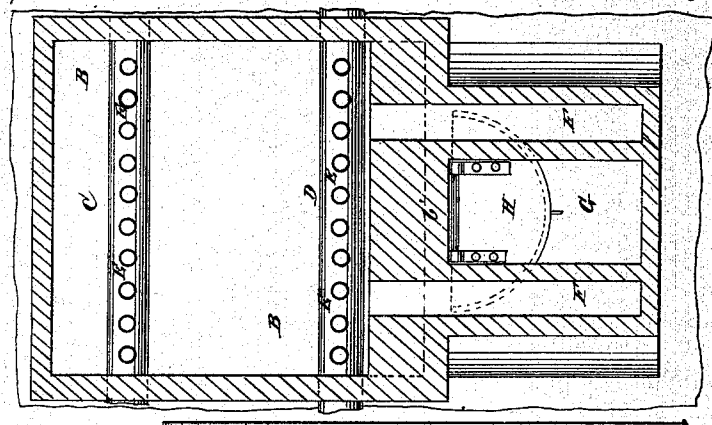
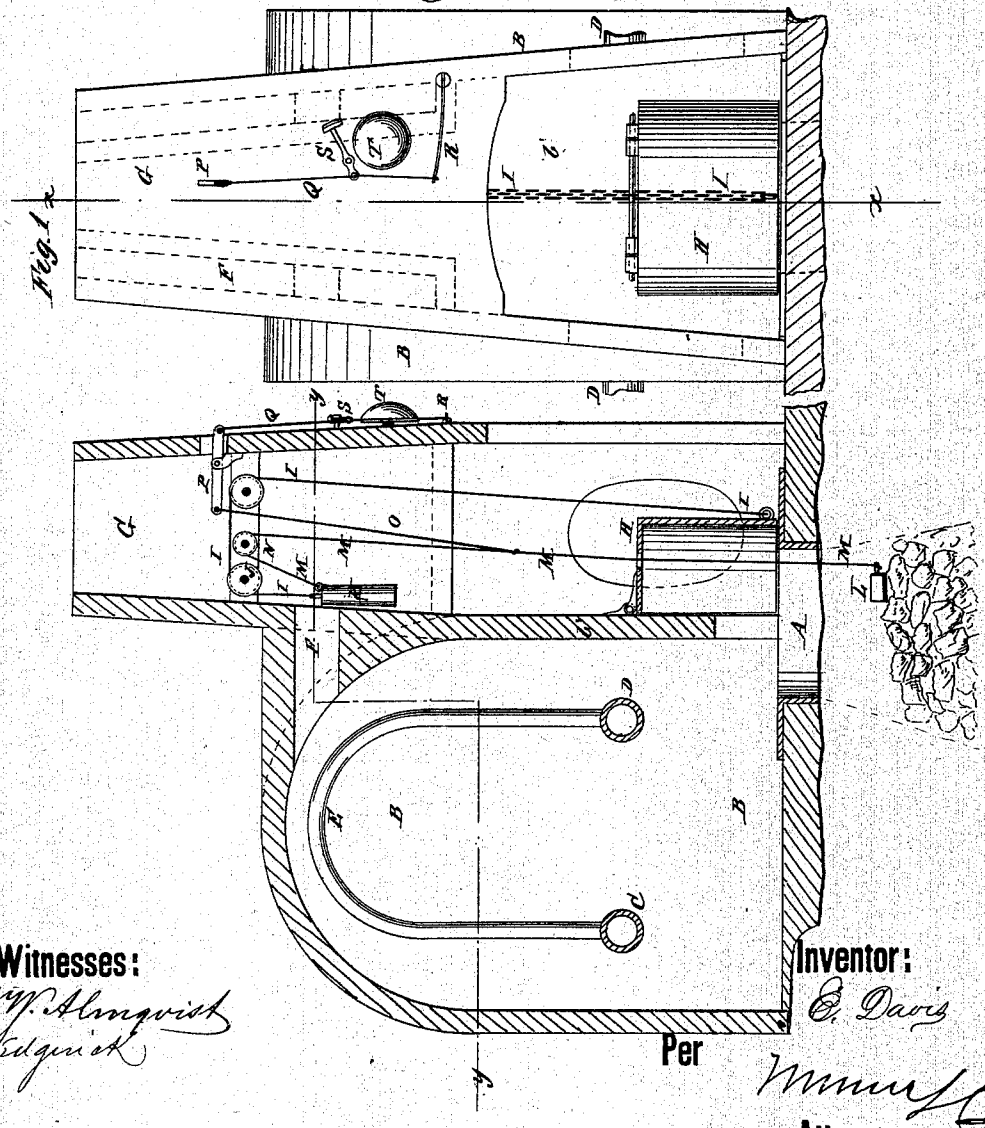


Fig. 1



Witnesses:

A. W. Almquist

Edgar Tate

Inventor:

E. Davis

Per

Attorneys,

UNITED STATES PATENT OFFICE.

EDWIN DAVIS, OF MILLERTON, NEW YORK.

IMPROVEMENT IN BLAST-FURNACE ALARM APPARATUS.

Specification forming part of Letters Patent No. **139,300**, dated May 27, 1873; application filed March 29, 1873.

To all whom it may concern:

Be it known that I, EDWIN DAVIS, of Millerton, in the county of Duchess and State of New York, have invented a new and useful Improvement in Cover and Alarm for Hot-Blast Furnaces, of which the following is a specification:

Figure 1 represents a front view of my improved device. Fig. 2 is a vertical section of the same taken through the line *x x*, Fig. 1. Fig. 3 is a horizontal section of the same taken through the line *y y*, Fig. 2.

Similar letters of reference indicate corresponding parts.

My invention has for its object to improve the construction of hot-blast furnaces, to enable the escaping gases to be more effectually utilized for heating the air before it is driven into the furnace, and to indicate when the furnace is ready for another charge. The invention consists in the employment of a cover for closing the part of the furnace-top outside of the air-heating chamber; in the combination of the chain and balance-weight with the cover of the furnace-top; in the combination of the weight, chains, lever, chain, and the spring, hammer, and gong with the cover and balance-weight; and in an arrangement of mechanism by which an alarm may be sounded automatically by the descent of the ore in the furnace, as hereinafter fully described.

A is the top of the furnace through which it is fed or charged, and through which the smoke and gases escape. B is a chamber or oven for heating the air for the blast, the front wall *b'* of which is built directly over the top A of the furnace, and has an arch formed in it so that it may not impede the insertion of the charge. C represents the pipe into which the cold air is introduced; and D is the pipe from which the heated air passes to the furnace. The pipes C and D are connected by small bent or arched pipes E, through which the air passes so as to be exposed to the heat in small streams. The smoke and gases escape from the top of the chamber B into flues F, which flues may be directly over the chamber B, or at the side of the flue G over the top A. H is a cover hinged to the wall *b'* so that it may be turned up out of the way when charging the furnace. The cover H is so formed as to closely cover the part of the top A in front of the wall *b'*, and thus compel all the smoke and gases to escape through the chamber B and flues F and more effectually heat the air for the blast.

To the forward edge of the cover H is attached one end of a chain, I, which passes over guide-pulley J, pivoted in the upper part of the flue G, and to its other end is attached a weight, K, which so nearly balances the cover H that said cover may be readily raised and lowered. L is a small weight attached to the lower end of the chain M, which chain passes up through a hole in the cover H, passes over a guide-pulley, N, pivoted in the upper part of the flue G, and its other end is attached to the weight K, so that as the weight K descends when raising the cover H the weight L may be drawn upward out of the way when charging the furnace. To the chain M is attached the end of another or branch chain, O, the other end of which is attached to the end of the lever P that passes out through and is pivoted in a hole in the wall of the flue G, and to its other or outer end is attached a chain, Q, which is connected with a spring, R, and the hammer S of a gong, T. The weight L is designed to rest upon the ore in the furnace, and descends with said ore, straightening out the chains M, O, so as when the ore has descended so low that the furnace requires another charge the gong will be sounded to notify the attendant.

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

1. The cover H in combination with the furnace-top A to cover that part of it outside the air-heating chamber, as specified.

2. The combination of the chain I and balance-weight K with the cover H of the furnace-top A, substantially as herein shown and described.

3. The combination of the weight L, chains M O, lever P, chain Q, and spring, hammer, and gong R, S, T, with the cover H and balance-weight K, substantially as herein shown and described.

4. The combination of the weight L, cords, lever, and gong, as and for the purpose specified.

EDWIN DAVIS.

Witnesses:
T. J. HOUSTON,
A. J. COPP.