(No Model.)

J. ANDREWS.

RELIEF DEVICE FOR BLAST FURNACES.

No. 554,569. Patented Feb. 11, 1896.

Fig. 1.

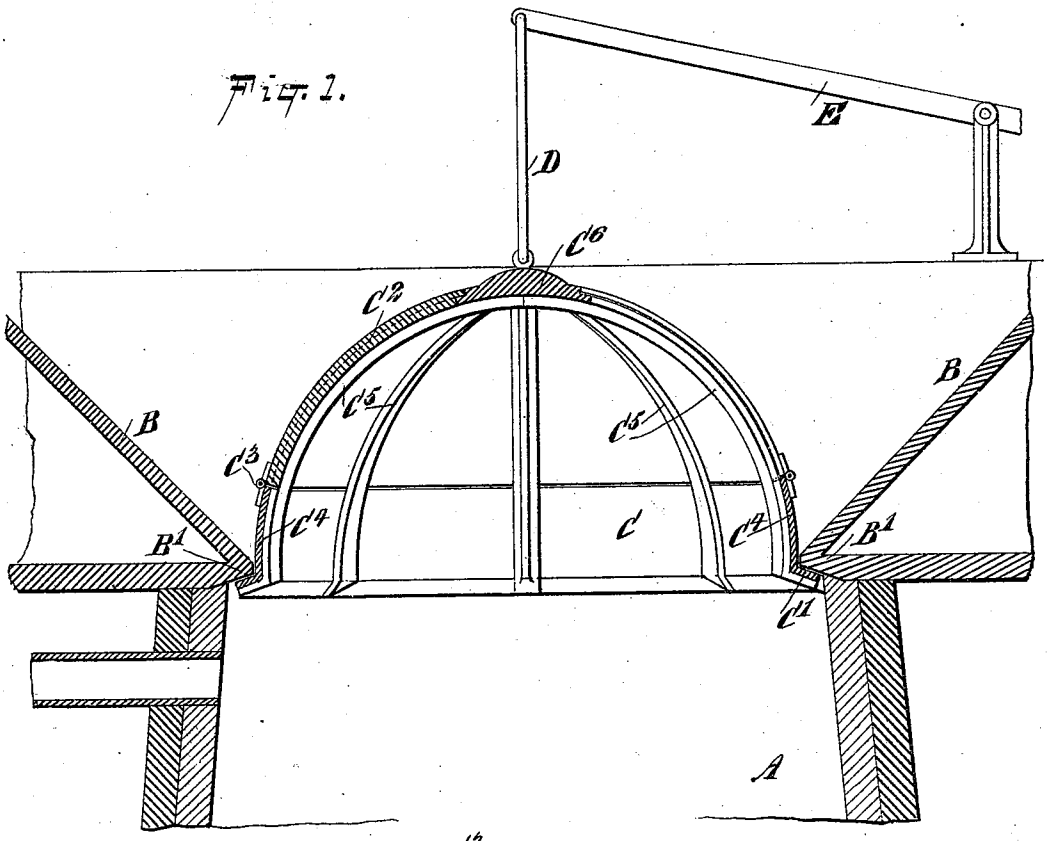
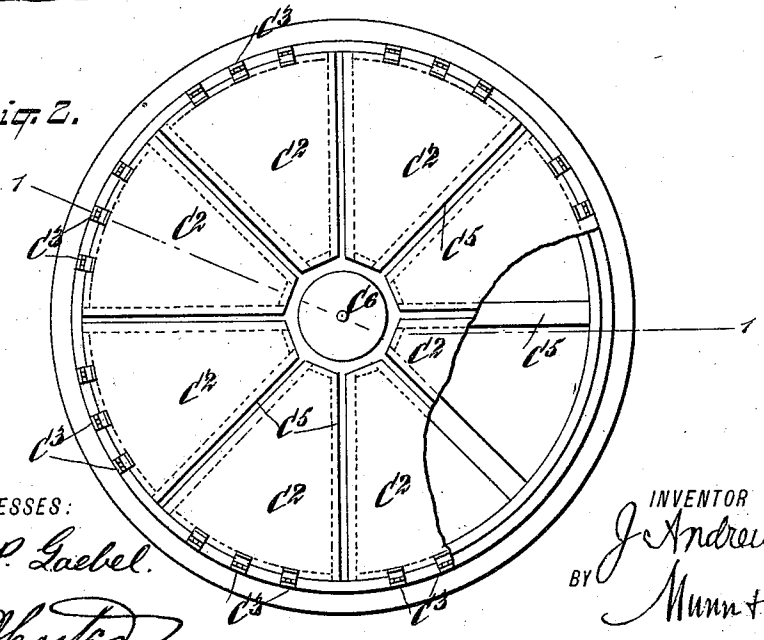


Fig. 2.



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RELIEF DEVICE FOR BLAST-FURNACES.

SPECIFICATION forming part of Letters Patent No. 554,569, dated February 11, 1896.

Application filed December 6, 1895. Serial No. 571,237. (No model.)

To all whom it may concern:

Be it known that I, JAMES ANDREWS, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and Improved Relief Device for Blast-Furnaces, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved relief device for blast-furnaces, arranged to afford instant relief in case a sudden explosion takes place in the top of the stack by gases accumulating therein.

The invention consists of a bell provided at its sides with doors, hinged at their lower ends to the bell a suitable distance above the base thereof, and normally forming part of the sides of the bell, said sides being adapted to swing outwardly upon pressure from the inside of the bell.

The invention further consists of a bell formed at its base with an outwardly-extending flange adapted to be seated on the under side of the hopper.

The invention also consists of 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 characters of reference indicate corresponding parts in both the figures.

Figure 1 is a sectional side elevation of the improvement, and Fig. 2 is a plan view of the bell with parts broken out.

The blast-furnace on which the improvement is applied is provided with the usual stack A, supporting at its upper end a hopper B, projecting at its lower end into the upper end of the stack, so as to form a seat B′ on the under side of which is adapted to rest a flange C′, extending outwardly and slightly downwardly from the base of the bell C. The bell is supported on the top by a link D from a lever E, serving to lower and raise the bell in the usual manner to permit the charge contained in the hopper B to pass into the stack of the furnace or close to the stack, as the case may be.

The bell C is provided with a number of doors C^2 forming part of the sides of the bell, and connected at their lower ends by hinges C^3 to the solid base part C^4 of the bell, as is plainly shown in the drawings. The doors C^2 are normally seated on ribs C^5 extending from the base part C^4 to the top center portion C^6 to which the link D is attached. The ribs C^5 are provided at the seats for the doors with grooves or recesses in which asbestos or other packing can be placed to prevent escape of gases.

Now it will be seen that when the bell is in use and an explosion takes place in the upper end of the stack A by gases accumulating therein or from other causes then a pressure is exerted against the doors C^2 and the latter consequently swing outwardly into an open position to permit the gases to escape, thereby insuring an instant relief to the stack and preventing damage.

It will be seen that by having the doors hinged a suitable distance above the extreme lower end of the bell the charge contained in the hopper B at the time the bell is in a closed position does not prevent the doors C^2 from swinging open in case of an abnormal pressure against the doors from the inside of the stack in case of an explosion, as above explained. The doors are sufficiently heavy to withstand the ordinary pressure of from seven to twelve pounds within the furnace.

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

1. A relief device for blast-furnaces, consisting of a bell having doors hinged at their lower ends to the bell a suitable distance above the base thereof, said doors normally forming part of the sides of the bell, and the doors being adapted to swing open upon pressure from the inside, substantially as shown and described.

2. A relief device for blast-furnaces, consisting of a bell comprising a solid base part and a center part, doors hinged to said base part, and ribs extending from the base part to the center piece, said ribs and center piece forming seats for the doors, substantially as shown and described.

JAMES ANDREWS.

Witnesses:
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