J. SMITH, Dec'd.

C. S. SMITH & W. G. BATES, Executors.

DRYING AND GLAZING GUNPOWDER.

No. 46,275. Patented Feb. 7, 1865.

Fig: 1.

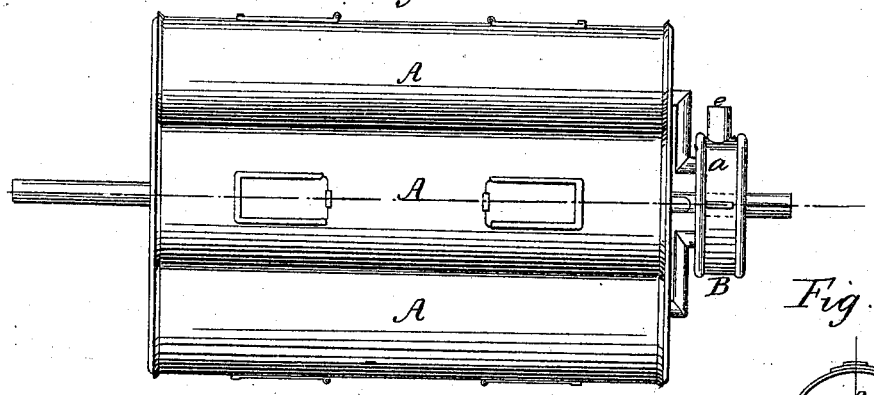


Fig: 3.

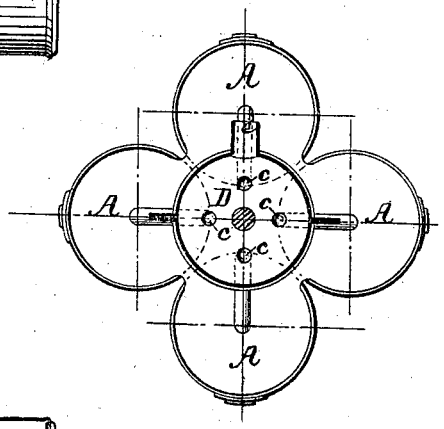
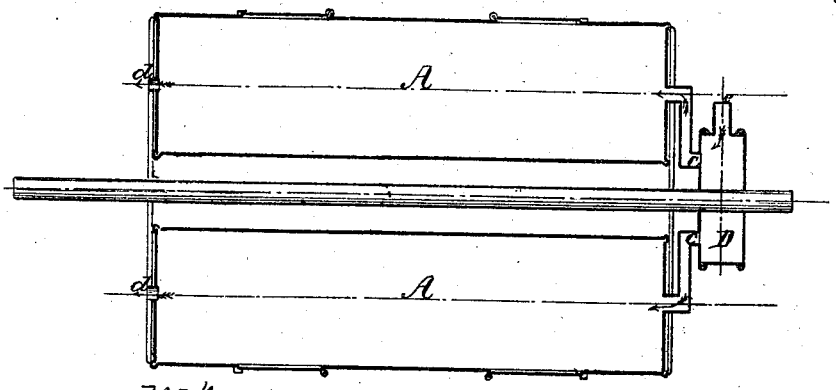


Fig: 2.



Witnesses,
Rich. W. Jaspin
Asa Smith
Fannie B. Bates
Jeanie A. Greenough

Catharine S. Smith
Executrix
Wm G Bates Executor
of the last Will of said John Smith

UNITED STATES PATENT OFFICE.

WILLIAM G. BATES, OF WESTFIELD, MASS., AND CATHARINE S. SMITH, OF KINGSTON, N. Y., EXECUTORS OF JOHN SMITH, DECEASED.

IMPROVEMENT IN DRYING AND GLAZING GUNPOWDER.

Specification forming part of Letters Patent No. **46,275**, dated February 7, 1864.

To all whom it may concern:

Be it known that JOHN SMITH, late of Kingston, Ulster county, State of New York, now deceased, discovered a new principle of operation in the method of drying and glazing gunpowder, and an apparatus for using and applying such principle; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and the letters of reference marked thereon.

The nature of the said discovery consists in applying heat to the barrel or other vessel in which gunpowder is being glazed, while the process of glazing is going on, thus combining the process of drying with the process of glazing gunpowder, and performing both at the same time.

To enable others skilled in the art of making gunpowder to use the said discovery, we will proceed to explain the method of applying the same, invented by the said JOHN SMITH, together with the advantages of the process.

Heretofore the powder after having been grained in the corning-mill has been put into revolving barrels or cylinders, partially filling the same, and glazed by the attrition of the grains as the barrels or cylinders revolved. The next process is to remove the the powder to the "dry-house," and there submit it to the action of heat.

The principal objection to this method is that the process is slow, and the liability to serious accidents in consequence of the accumulation of powder is much greater than in using this system, which combines the two processes in one, and greatly decreases the time expended in reaching the same result by the old method.

We are aware that drying to a limited extent has been accomplished by the admission of cold air into the barrels, making a circulation; but we are not aware that heated air, or heat produced or carried in any manner has ever been introduced into the barrels for the purpose of drying the powder and assisting in the glazing. After many experiments we find that by introducing heat into the glazing-barrels while the process of glazing is going on we can both glaze the powder and dry the same in less than half the time consumed by the old process, and the glazing is more perfectly performed. The method of doing this, which we prefer, is to admit or force hot air directly into the glaze-barrels containing the powder, producing a current of heated air through the cylinders in a greater or less degree while the barrels or cylinders are revolving. This dries and dusts the powder, and renders the process of glazing more perfect. Heat can be conducted through the cylinders by steam or hot water in pipes and in other ways, but we prefer the direct application of the heated air, and we would refer to the accompanying drawings in illustrating the method of use. We generally use a cluster of barrels, consisting of four cylinders placed longthwise around a common axis, by which the whole is revolved together. These cylinders have holes, two in each, covered with slides, through which the powder is placed in and taken out of the cylinders.

Figure I represents a view of the cluster, in which three of the cylinders appear at A A A. Fig. II represents a sectional longitudinal view of the cluster, showing the interior of two of the cylinders. Fig. III represents a vertical section of the drum, through which the hot air is introduced into the cylinders.

This drum appears in Fig. I at B, and a lateral section thereof in Fig. II at D. This drum is so constructed that the heads of it revolve with the axis to which they are fastened. The remaining portion of the drum, (shown in Fig. I at *a*,) and in which is an aperture for the admission of hot air, remains stationary, the heads revolving upon it as closely jointed as possible, so as to admit but little if any escape of the hot air. The head of the drum next to the cylinders is perforated with four holes communicating by tubes with each of the cylinders at or near the center of the circular end of each, as shown in the figures at C C C C. At the center of the other end of the cylinders is an aperture, one in each, for the escape of the air after passing through the cylinders.

The hot air is forced into the drum by blowers, or otherwise, from a furnace situated at a safe distance from the apparatus, while the cylinders with the powder in them are revolving. The hot air passes through the drum and pipes into the cylinders and out at the

other end of the same, the cylinders in the meantime constantly revolving, and thus the process of drying and glazing at the same time goes on till finished.

What we claim as the discovery and invention of the said JOHN SMITH, and for which we desire Letters Patent, is—

1. The application of heat to the cylinders or other vessel in which powder is glazed, while the process of glazing is going on, for the purpose of glazing and drying the powder at one operation, substantially as above described.

2. The method of carrying the same into operation by means of hot air and the apparatus above described, substantially as above set forth.

CATHARINE S. SMITH.
WM. G. BATES.
Executors of John Smith, deceased.

Witnesses as to signature of Catharine S. Smith:

R. W. TAPPIN,
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Witnesses as to signature of William G. Bates:

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C. J. SNOW.