(No Model.)

W. H. KENNEDY.

METHOD OF AND APPARATUS FOR THE PRODUCTION OF MINERAL WOOL.

No. 436,244 Patented Sept. 9, 1890.

Fig. 1.

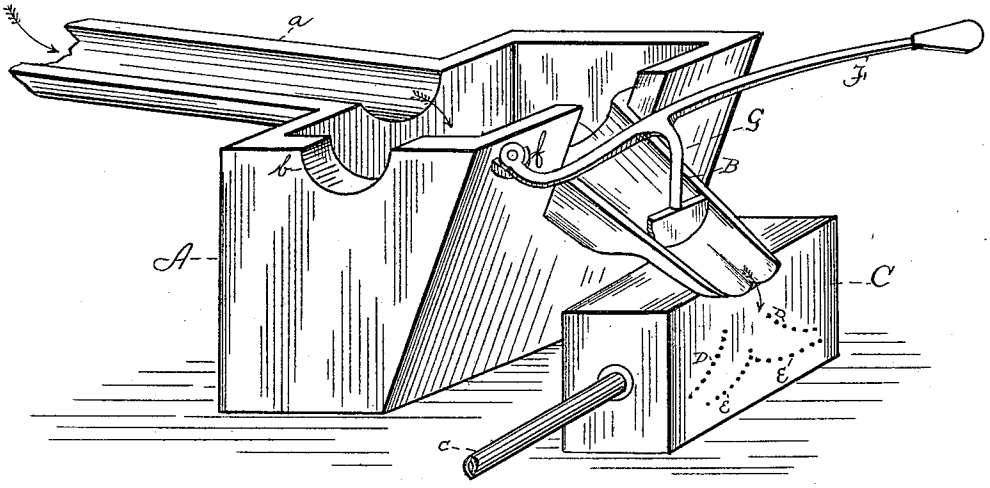


Fig. 2.

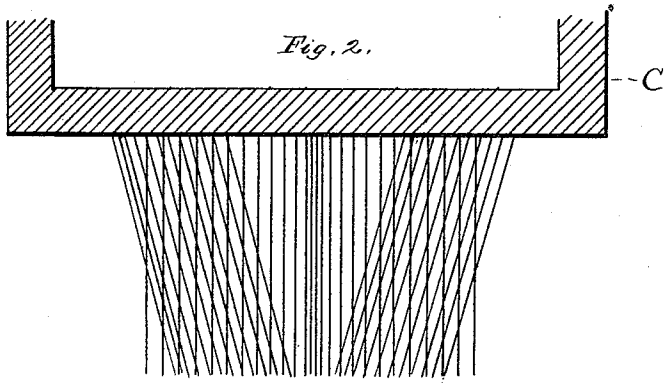


Fig. 3.

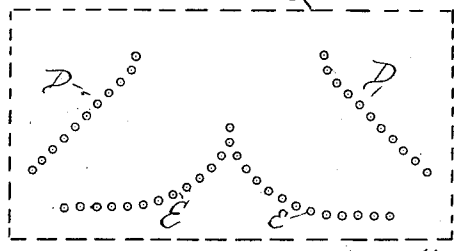
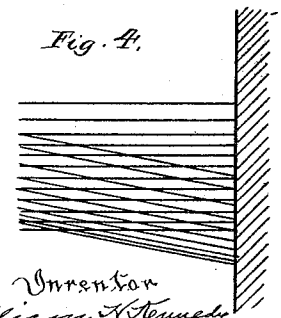


Fig. 4.



Witnesses:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILLIAM H. KENNEDY, OF ETNA, PENNSYLVANIA.

METHOD OF AND APPARATUS FOR THE PRODUCTION OF MINERAL WOOL.

SPECIFICATION forming part of Letters Patent No. 436,244, dated September 9, 1890.

Application filed May 1, 1890. Serial No. 350,182. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. KENNEDY, a citizen of the United States, residing at Etna, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in the Method of and Apparatus for the Production of Mineral Wool; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Heretofore, so far as I am aware, mineral wool has been produced by blowing a jet or jets of steam or air against a stream of molten slag or by treating the same to encircling jets of air or steam. By both these methods the falling slag is struck by the steam or air when an almost solid column, the outer surface of which chilling quickly by the atmosphere is not properly acted upon by said steam or air and a very considerable quantity of the slag, instead of being converted into fine fiber or wool, is formed into hard globs, or what are known to the trade as "buckshot." By my method, however, the slag is spread out fan-shaped in descending upon the jets of steam or air, presenting a thin sheet to the action thereof in such manner that the air or steam issuing from the series of round inclined perforations reduce said slag to the greatest number and smallest possible fragments of fine fiber or wool, thereby increasing the quantity and improving the quality without increasing the power used.

I will now describe my invention, so that others skilled in the art may employ the same, reference being had to the accompanying drawings, in which—

Figure 1 indicates a perspective of my improved mineral-wool-producing apparatus. Fig. 2 is a plan of steam-chest, projecting lines indicating steam in series of jets issuing therefrom. Fig. 3 is a front elevation of same. Fig. 4 is a side elevation of same.

Heretofore, so far as I am aware, in all devices used in the production of this material the steam or air has been projected against the descending slag through slots in the steam-chest or through flat nozzles, and great care has been taken to prevent the lateral spread of the slag when subjected to the action of the air or steam, thus, as heretofore stated, presenting an almost solid column of slag to the action of the jets of steam or air and from defective action of the steam or air upon said slag, producing with the wool a considerable quantity of buckshot. By the use of my method and apparatus this is greatly remedied and a better quality of wool produced.

Referring to the drawings, A is a tank constructed of cast-iron or other suitable material, and may be of any desirable size, preferably large enough to contain about fifteen gallons of molten slag, which flows, as indicated by the arrows, from the furnace (not shown) through the run or trough *a* into said receiving vessel or tank. *b* is an overflow or discharge at one side of said tank for the purpose of regulating the quantity of slag permitted to flow through the inclined trough B at the front of said tank, and to fall upon the jets of air or steam issuing from the series of round perforations formed in the front of the steam-chest C, which is supplied with steam or air through the pipe *c*, which connects said steam-chest with a boiler (not shown) or other source of supply of steam or air. Said chest is provided in its front wall with four series of openings D D E E, the two upper series of openings D D being inclined or converged toward each other in a horizontal plane, and the two lower series of openings E E being inclined vertically to the plane or inclination of said upper series of openings. One of the two lower series of openings E E is inclined reversely to the other series of such lower openings, and said two lower series of openings form at their juncture the apex of inclined planes. The openings constituting one series of openings D D or E E are parallel to each other, and each series of openings are inclined to the face of the steam-chest, the inclination of the jets or streams from the upper series of openings D D being indicated in Fig. 2, and the inclination or convergence of the streams or jets from the lower series of openings being indicated in Fig. 4. The jets or streams from the lower series of vertically-converging passages E E operate upon the

stream of molten slag to spread it horizontally out into a thin sheet, and the several series of jets or streams from the horizontally and vertically converging passages intersect a short distance from and in front of the steam-chest, as indicated in Figs. 2 and 4.

F is a lever pivoted at its inner end to the lug *f*, secured upon the upper side of said tank, and is adapted to operate the scraper G, which is secured thereto for the purpose of breaking or knocking off slag which has chilled upon said chute or trough. In the practice of my invention I form said perforations about three thirty-seconds of an inch in diameter, and for the inner jets of the upper series about two and a half inches apart when said steam-chest is about five to six inches long, maintaining this distance in proportion as the size of the chest is increased or decreased. The jets in either upper series respectively are parallel to each other and converge toward the center. The lower series separately viewed each form a crescent, which conjoined, as shown in Figs. 1 and 3, form inclined planes for the purpose of spreading the slag or cinder laterally their entire length. The perforations forming said lower series are also parallel to each other with an upward inclination so as to intersect the jets from the upper series a short distance from the steam-chest, as shown in Figs. 2 and 4.

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

1. The herein-described method of producing mineral wool, which consists in subjecting liquid slag to four series of blasts or currents of air or steam, two upper series of such air or steam currents converging toward each other in horizontal planes, and the plane of the lower series of air or steam currents converging vertically to those of the upper series, as set forth.

2. The herein-described method of producing mineral wool, which consists in subjecting liquid slag to four series of blasts of air or steam, the line of flow of each current of steam or air of each series being parallel to the other currents of the same series and passing through minute perforations or passages, the two upper series of such blasts or currents converging in horizontal planes and the lower series of blasts or currents converging vertically to the line of the upper series of blasts, as set forth.

3. In the manufacture of mineral wool, the combination of a chest, means for supplying steam or air thereto, and four series of openings, of which the two upper series are inclined toward each other in a horizontal plane, the plane of the lower series being inclined vertically to that of the upper, substantially as described.

4. In the manufacture of mineral wool, a converting device or apparatus provided with series of round perforations or jets, the jets of each series of which are parallel to each other, two of the series of perforations converging in a horizontal plane, and the other series of jets or perforations inclined vertically to that of the other series, substantially as and for the purpose set forth.

5. In the manufacture of mineral wool, a converting apparatus provided with series of round perforations or jets inclined to the face of the steam-chest, the jets of either series of which are parallel to each other, in combination with a tank for the reception of slag, substantially as described.

6. In the manufacture of mineral wool, a converting apparatus provided with series of round perforations or jets inclined to the face of the steam-chest, substantially as described, the jets of either series of which are parallel to each other, in combination with a tank for the reception of slag, and a scraper adapted to be operated by a lever for the removal of chilled slag from the pouring-trough of said tank, substantially as and for the purpose herein described.

7. In the manufacture of mineral wool, a converting device provided with a plurality of series of jets or perforations, the upper series of said jets or perforations being inclined to the face of the steam-chest in horizontal planes, and the lower series of jets or perforations being inclined in vertical planes and meeting or intersecting with each other at a point between the inclination of the upper series of perforations or jets, substantially as described, for the purpose set forth.

8. In the manufacture of mineral wool, a converting apparatus provided with series of parallel round perforations or jets, the lower series of which conjoined form inclined planes for spreading the slag falling toward the same in a lateral direction, substantially as and for the purpose herein described.

In testimony that I claim the foregoing I hereunto affix my signature this 26th day of April, A. D. 1890.

WILLIAM H. KENNEDY. [L.S.]

In presence of—
R. J. STONEY, Jr.,
W. E. JOHNSTON.