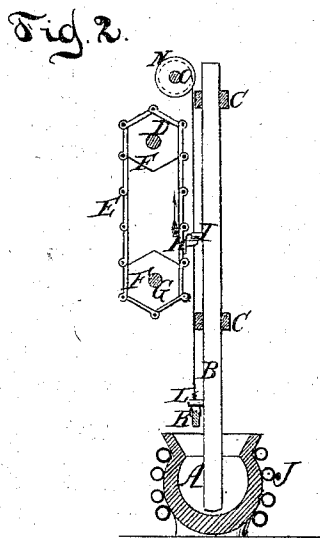
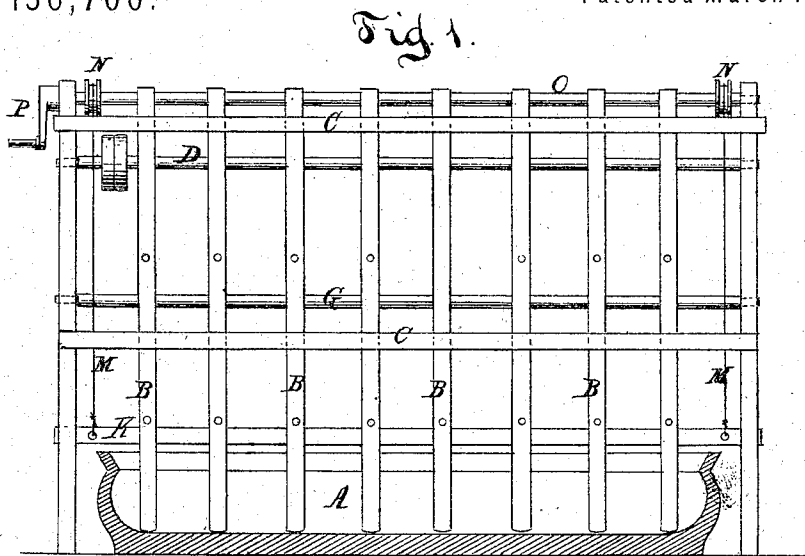


G. B. CANNING.

Apparatus for Comminuting Various Substances.

No. 136,700.

Patented March 11, 1873.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE B. CANNING, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN APPARATUS FOR COMMINUTING VARIOUS SUBSTANCES.

Specification forming part of Letters Patent No. **136,700**, dated March 11, 1873.

To all whom it may concern:

Be it known that I, GEORGE B. CANNING, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Apparatus for Comminuting Various Substances; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 is a central and vertical longitudinal section of the apparatus representing my invention. Fig. 2 is a vertical cross-section of the same.

Similar letters indicate corresponding parts.

This invention relates to comminuting or pulverizing various substances—such, for instance, as mustard or spices; and consists in an elongated mortar provided with a series of independent pestles working side by side therein, and operated from the same shaft by chains and chain-wheels in such a manner that they are caused to drop into the mortar consecutively. The whole series of pestles is raised simultaneously by a common lifter when it is desired to remove the pulverized substance from the mortar. Heat is applied to the mortar when it is necessary or desirable to impart warmth to the contents of the mortar, by means of steam-pipes arranged around or in the walls of the mortar. The application of heat thereto is advantageous in the manufacture of mustard, as, by means of a moderate degree of heat, the turmeric which is commonly mixed with the mustard in order to give to it a bright appearance is increased in brilliancy, and the pulverized mustard is consequently made to take on a brighter appearance.

The letter A designates a mortar constructed in such a manner as to permit a series of independent pestles, B, to work therein side by side. The pestles can be made of any desired shape or size, but their operating ends should be rounded and should conform in some measure to the form given to the interior of the mortar. The shanks of the pestles work in guides C, which form parts of frame-work which supports the shafts hereinafter mentioned. The pestles are lifted successively by the agen-

cy of a common shaft, D, running the whole length of the mortar and provided opposite the shank of each pestle with pulleys and chains or equivalent lifting apparatus, as represented in Fig. 2, so that as the shaft is revolved the chains are caused to lift their adjacent pestles and let them drop into the mortar. The mode here shown of carrying out this part of my invention consists in providing a chain and chain-pulley, E F, the chain E running around a like pulley, F, fixed on a counter-shaft, G, below driving shaft D, so as to cause the chain to move near to and parallel with the shank of its appropriate pestle, the direction of the motion being indicated by the arrow. Some of the links of the chain are provided with tappets H, which come under a spur, I, that projects from the shank of the pestle, and thereby lift the pestle as high as the chain-pulley, when the spur is released by the withdrawal of the tappet as it passes over the pulley, and the pestle is allowed to drop into the mortar, the tappets H being far enough apart to prevent interference with the falling pestle. Each pestle is provided with its appropriate chain and pulley arranged on the driving-shaft D, and the tappets of the several chains are arranged so as to cause the pestles to fall one after another in succession.

This construction enables me to manufacture mustard, and other substances which require to be pulverized in preparing them for market and for use, with great facility and economy, using a single mortar to receive the whole mass which is operated upon by the whole series of pestles. The elongation of the mortar gives increased facility for removing the pulverized mass therefrom, as the operator can work to greater advantage than where a circular mortar of the common kind, adapted for a single pestle, is used.

The whole series of pestles is raised simultaneously out of the mortar to give access thereto for removing the contents after pulverization has been completed, by means of a lifting-bar, K, which lies on the mortar and below a series of spurs, L, arranged on the pestles at the same elevation. The bar K is guided at its ends in the frame-work of the apparatus, and it is lifted by means of cords M fastened to pulleys N which are fixed on a

shaft, O, supported at the top of the framework, which shaft is revolved to wind up the cords by means of a crank, P, as shown in Fig. 1.

In pulverizing and preparing mustard for market, turmeric is added during the operation in order to give a bright appearance to the mustard. By warming the body of the mortar I am enabled to enliven the turmeric and cause it to develop a brighter luster than when left in a cool state, so that a brighter appearance is imparted to the mustard without doing it any injury. The mortar can be warmed so as to impart sufficient warmth for the purpose required to the turmeric and to the mass of mustard by means of a coil, J, of pipe surrounding the mortar, through which steam is passed in suitable quantities. The body of the mortar can be warmed from below or in any other suitable manner preferred by the manufacturer.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the series of pestles B, of a series of chains and chain-pulleys arranged upon a common shaft, as shown, the chains being provided with tappets H, which act on the pestles by means of spurs I, which project therefrom, as described.

2. The combination, with the series of pestles, of a lifting-bar, K, arranged so as to raise the whole series out of the mortar simultaneously, substantially as described.

3. The combination, with a mortar, of steam-pipes J to heat the same and its contents, substantially as described.

GEO. B. CANNING.

Witnesses:

W. HAUFF,

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