

*L. B. Fitcher,*

*Mortar Mixer.*

*No. 106282.*

*Patented Aug. 9, 1870.*

FIG. 1.

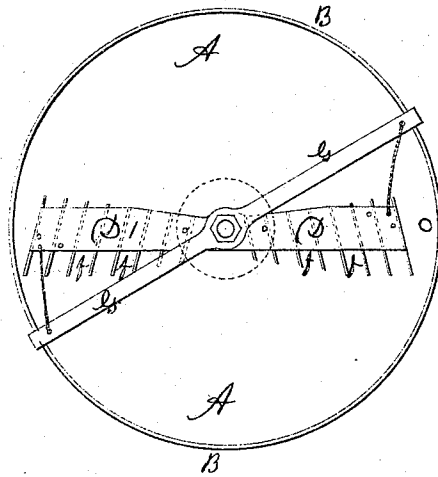
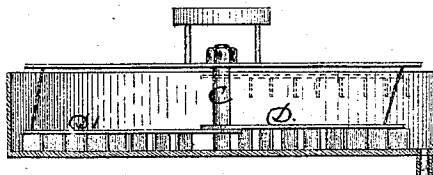


FIG. 2.



*W. B. Smith*  
*A. B. Sabine*

WITNESSES

*Leman B. Fitcher* INVENTOR

# United States Patent Office.

LEMAN B. PITCHER, OF SALINA, NEW YORK.

Letters Patent No. 106,282, dated August 9, 1870.

## IMPROVEMENT IN THE PREPARATION OF LIME AND MORTAR.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, LEMAN B. PITCHER, of the town of Salina, in the county of Onondaga and State of New York, have invented a new and improved Lime-preparing and Mortar-mixing Machine, and mechanical process of doing the same; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawing making part of this specification.

The letters used represent corresponding parts wherever they occur.

To enable others to make and use my invention, I will proceed to describe the same, its mode of operation, and the manner in which it may be applied to practical use.

Figure 1 represents a perspective view, and Figure 2, a cross-sectional view.

This invention relates to slaking and reducing quick-lime with water to a soft or liquidized paste, and separating therefrom the lime granulates and dregs, and mixing it, when required, with sand, hair, or other materials, into mortar compounds, by means of a circular vat and a circular motion given and applied to the machinery and materials therein.

In my endeavors to prepare lime for and to make mortar by steam or other motive-powers, the want of a way to slake lime with economy and dispatch in quantities, and handle and prepare it for use by machinery and power, has become apparent to me.

To meet that want of a way, I construct a flat, round, and basin-shaped cistern or vat, A, ten feet, more or less, across, with outer walls or rim B, rising two feet, more or less. The bottom may be made of two-inch (more or less) plank, hard wood or other materials being best, and let into the rim or staves.

The rim may be made of staves, standing nearly upright, two inches thick and five inches wide, more or less, of wood or other suitable material, with iron hoops to hold it together. Any part of the vat may be made of any other suitable materials, in any mechanical manner.

In the center of the vat I erect a round shaft, C, or post, eight inches, more or less, in diameter, and one inch, more or less, higher than the rim of the vat, with a center part three inches, more or less, in diameter, standing four inches higher, more or less, than the larger part of the post, the post to be fastened to the place by any mechanical means.

Two working sweeps or sweep-frames, D D, each twelve inches wide and one and one-half inch thick, more or less, either way, with a hole eight and one-half inches, more or less, in diameter, in one end of each, are made to fit in an easy manner around said post C, and reach toward and nearly to, yet not touch, the inner periphery of opposite sides of the vat or rim.

They are to be adjusted one above the other, so as not to interfere with each other, and to work easy around the post, and made to move or swing around in the vat A.

To the under side of the lower sweep, D', is affixed, near their middle scrapers *ffff*, in series made one-half inch thick, four inches wide, and fifteen to twenty-five inches long either way, more or less, made fast to the face of and extending one or both ends outwardly and sidewise downwardly from said working sweep once in six inches, more or less, standing or positioned obliquely to the line of length of the sweep D', and so adjusted that the back end of the first scraper on the lower sweep D' shall move in a circle ten inches, more or less, from the post C, while the forward end of the first scraper shall follow the circular track made by the back end of the second scraper in series, while the forward end of the second scraper shall follow the circle of the back end of the third scraper, and so on until the forward end of the last scraper on sweep *ff* shall follow the inner periphery of the outer wall or rim B. One action of this working sweep when worked alone is, that the series of scrapers shall work more and collect the granulates and dregs of lime in a pile around the center-post C.

The other or uppermost working sweep, D, is to be armed and provided with like scrapers attached to the sweep D in a like manner, with this difference, that they are to be six inches, more or less, wide, and so positioned and adjusted as to work, move, and leave room for, and to pile up the dregs around the outer periphery B of the vat when worked alone. The combined action of both working, moving, and swinging around at the same time is to cause the lime-pastes and dregs to be moved alternately outwardly and inwardly, and at the same time circuitously, around in the vat, whereby the lime dregs are kept spread out over the bottom of the vat, which action and result, in combination with the rapid whirling or run-around motion given to the fluid paste in said vat readily reduces and washes out all fine and available limes from the lime dregs.

When so washed out, the second working sweep, D, may be lifted or stayed up to bar G, and leave sweep D' to keep up the whirling and washing motion, and at the same time to collect the remaining lime dregs around post C, from whence they may be removed by a shovel or by other means.

All parts of this machine may be made of wood, iron, or other suitable materials. Working sweeps D' and D should weigh twenty pounds, more or less, to each foot in length.

By this process the lime dregs can be quicker and cheaper worked and separated from the fine lime or fluid paste than by any other process known to me.

A sweep-bar, G, three inches thick and five inches wide, more or less, either way, with a swell in the middle, with a hole in the center to fit to the small and upper end of post C, and long enough, or a little more, than that reach from side to side of the vat A, is to be adjusted on said post, so that it can revolve around.

Working sweeps are each to be connected by a chain or other suitable means to sweep-bar, at or near their outer ends, in such a manner that working sweeps D' and D shall be positioned and follow at near right angles, more or less, to sweep-bar G, to the end that working sweeps may have liberty to rise and fall while working through the crude paste in vat A.

When about to slake lime, I prefer to raise and attach working sweeps D' and D to sweep-bar G by means of chains or by other means, that it may be out of the way.

The working operation may be stated thus:

Into vat A, I put and spread a wagon-load of lime, of sixty bushels, more or less, at a time, and add without delay all the water which the lime will absorb in slaking, and no more. I prefer to cover the vat to keep the heat in, that the lime may slake quicker and better, and to let it remain at rest one hour, more or less, according to circumstances.

The amount of water and the time required will depend upon the quality of the lime, which varies in different localities, and, as a result, no definite amount or time can be given, but the same may be determined by experiment with the lime to be slaked.

It requires as much or more time to slake three to eight bushels of lime at a time in the usual manner as it does to slake sixty by this process and machinery.

To stir up and thoroughly wash out by hand the lime-dregs of eight to sixty bushels at a time is a very slow and difficult work to do.

With this machine in use, when the lime is ready to be stirred up I remove the cover, if employed, add water enough to make the paste readily flow when stirred, and then let down working sweeps, hitch on a horse to the outer end of sweep-bar G, and trot him around at the rate of fifteen times per minute, more or less.

The more rapid the paste is moved on the floor of the vat, the sooner all available limes may be worked into and held in a running or liquid mass. With such motion the lime in the vat is soon reduced to a flowing or half liquid condition, and the lime dregs fall to the bottom of the vat, where they are actively cuffed and moved by the scrapers *ffff* in such a manner as to soon reduce all soft or putty-like dregs to a fluid paste. This result is facilitated by the rushing, whirling, and washing motion given to the fluid mass. I have named the horse as the motive-power, because, in many instances, his use will be most convenient, yet any other power may be applied in the way described, or in any other mechanical manner.

The lime dregs may be worked to the center, as described, or to the periphery, and taken out with the shovel, or by any other means; or the dregs may be

deposited in a sink, pocket, or bucket, sunk or made in the bottom or side of the vat A, with a lid or cover, or not, to be closed or opened, when required, from which place of deposit the dregs may be taken away; or the fluid paste may be drawn away from the dregs by means of a gate or faucet.

When the dregs and paste are separated from each other in either manner, as described, or by any other equivalent way, sand or other materials may be added to the paste and worked into mortar compounds, by means of working sweep, and the other parts of this machine and combinations, and the mechanical process employed.

I have made and employed working sweeps *ffff*, in combination with sweeps D' and D, and vat A, and other parts of the machine, as means well adapted to do the work described, and make available the mechanical process employed, yet I do not wish it understood that I believe it or them the only means.

I do hold that the vat should be round, or nearly so. It may be flat or otherwise at bottom. The sides may be perpendicular, or sloping, or otherwise. The post may be larger or smaller, stationary, or moving, or be dispensed with. The frame of working sweep S may work in, or above, or out of the materials being wrought. The part S may be made in the make and form described, or in any other equivalent manner.

The indispensable and distinguishing characteristics of this mechanical process are the doing of the work described by means of a circular vat, and a circular motion given and applied to the machinery and materials therein by means of the machinery described, or any other equivalent machinery revolving and working within the vat, which will operate the lime paste and dregs substantially as described.

This invention may be used as a lime-slaker and dregs-separator in preparing limes to be sifted or otherwise further worked by any other means, or as a lime-paste preparer, as herein more fully set forth.

This machine, with its movements, actions, and results, may also be employed to reduce clay with water to a flowing mass, and separate sand or gravel therefrom, after which the water may be allowed to separate from the clay-paste and be drawn or evaporated off, by which means and process a superior article of clay may be prepared for the purposes of brick, tile, or pottery-work.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. The mechanical process of slaking and preparing lime for use, substantially in the manner and for the purposes described.

2. The improved mortar-mixing machine herein shown, consisting of the vat A, post C, and sweeps D D', when the latter are hung loosely upon said post, and provided with blades *ffff*, all constructed, arranged, and operated in the manner and for the purpose set forth.

LEMAN B. PITCHER.

Witnesses:

N. B. SMITH,  
J. B. SABINE.