W. H. Smith,

Mortar Mixer.

No. 3,621. Patented June 10, 1844.

Fig: 1.

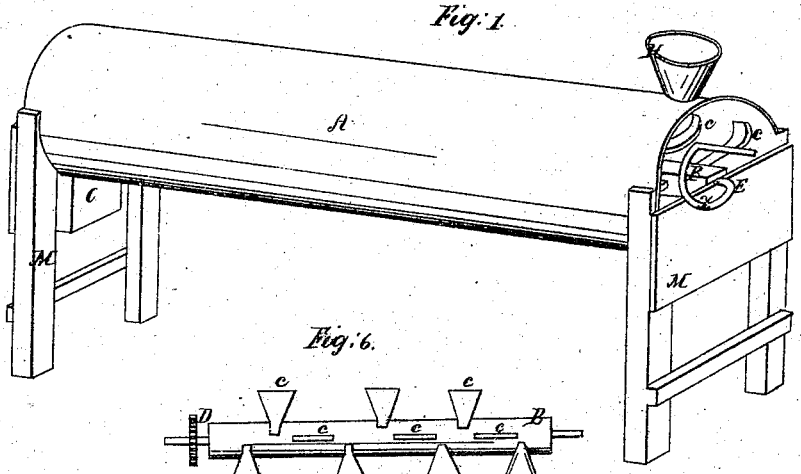


Fig: 6.

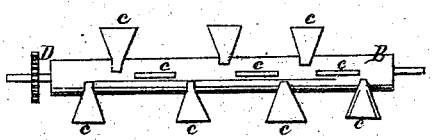


Fig: 2.

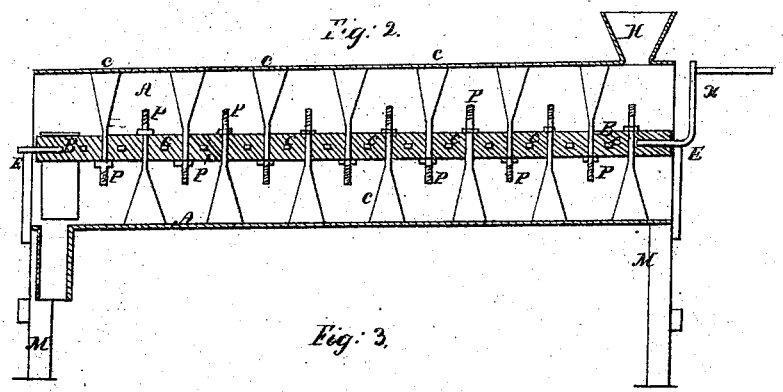
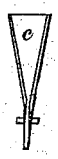


Fig: 3.

Fig: 5



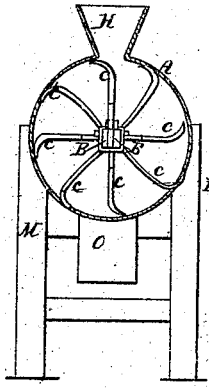
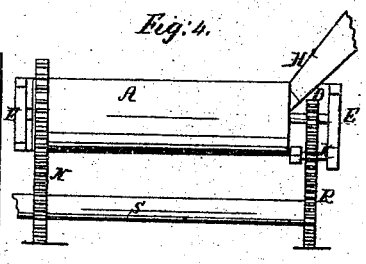


Fig: 4.



UNITED STATES PATENT OFFICE.

WM. H. SMITH, OF GEORGETOWN, DISTRICT OF COLUMBIA.

MAKING CEMENT.

Specification of Letters Patent No. 3,621, dated June 10, 1844.

To all whom it may concern:

Be it known that I, WILLIAM H. SMITH, of Georgetown, District of Columbia, have invented a new and useful machine for mixing up mineral substances in order to impart to them desirable properties or facilitate their consolidation and cohesion when used for cements and similar purposes, which machine is described as follows, reference being had to the annexed drawings of the same, making part of this specification, of which—

Figure 1, is a perspective view; Fig. 2, a vertical section of the same; Fig. 3, a vertical transverse section; Fig. 4, a top view or plan of revolving cylinder; Fig. 5, a view of the shape of the rubber; Fig. 6, represents the spiral mode of arranging the rubbers.

The machine consists mainly of a metallic cylinder, partially closed at both ends, marked A. Also a metallic axle (B) so constructed as to revolve within the cylinder in a horizontal direction, as seen, Fig. 1. And also a number of metallic rubbers, (C) arranged upon the axle so as to revolve with it and rub against the inner surface of the cylinder whenever the axle is set in motion.

The cylinder A may be constructed so as to remain stationary see Fig. 1, when the cylinder is permanently supported by frame M. A hopper H is attached to this cylinder at one end to receive the material that is to be worked up within the cylinder and an inverted hopper (O) is fixed at the other end to act as an outlet for the same. A revolving cylinder may be advantageously substituted for the stationary one. This is represented in Fig. 4, where A′ denotes the cylinder, L a cog-wheel affixed permanently to it and N designates an additional cog-wheel attached to the main shaft (S) of a water wheel or other power. The action of the revolving cylinder will be better understood by reference to the design and operation of the axle, (B). This axle is supported by a frame (Fig. 2, E) at each extremity of the cylinder, and it is caused to revolve within the cylinder, by a handle, Figs. 1 and 2, marked X, or by a cog-wheel D Fig. 4. When the cylinder is stationary the axle revolves in a given direction, but when the cylinder revolves, the axle must be caused to revolve in an opposite direction. This latter arrangement is shown in Fig. 4, where A′ represents the revolving cylinder, L a cog wheel attached to it firmly, (N) a cog fixed upon the main shaft (S) of a water wheel. The cogs N, and L work within each other to propel the cylinder. The axle is in this case made to revolve by two cog wheels additional to that which is fixed to itself—for example in Fig. 4, (D) represents a cog wheel fixed to the axle, (R) a cog fixed upon the shaft (S) and (K) an intermediate cog-wheel inserted so as to turn the axle in a direction opposite to that in which the cylinder revolves.

The friction is produced by means of rubbers (C) fixed to or arranged upon the axle, one end of which is inserted in the axle and the other reaching to the inner surface of the cylinder rubs against it. In Fig. 3, the shape of the rubber is represented. They are curved slightly at one end, and flattened as is also seen in Fig. 5, so as to present as great an extent of surface to the cylinder as possible. The rubbers are arranged spirally as represented in Fig. 6, for the purpose of working the material through the cylinder.

This machine can be used for working up or mixing together any mineral substances, such as common lime plaster, or ground hydraulic limestone, or any compositions for cement. All that is necessary is to mix up the ingredients with water after they have been pulverized and in this state place them within the cylinder. The material when it leaves the cylinder is in a condition to be used for cement or putty or molded into any form. It possesses properties superior to the same substance previous to its being operated upon by the machine.

I do not lay claim to any specific mode of preparing the material. The proportion of the cylinder can be varied to suit circumstances. I recommend the following. Let the cylinder be 10 feet long—one foot in diameter—the axle 3 inches thick and 12 long, so as to allow room for attaching it to a frame and cog wheel and the rubber to be long enough to extend from the axle to the cylinder so as to rub its inner surface. I recommend 40 rubbers to a cylinder of 10 feet, each to be made of a square steel bar one inch thick, at the end that is inserted in the axle and hammered out at the other end so as to be only $\frac{1}{10}$ of an inch thick and 3 or 4 inches wide, see Figs. 2, 5, and 6.

What I claim as my invention and which

I desire to secure by Letters Patent of the United States is—

The abovementioned and described machine, consisting of a metallic cylinder—metallic axle and metallic rubber all as above described. The cylinder to be either stationary or revolving, the axle to revolve within it—and the rubbers to be spirally arranged so as to rub against the cylinder when the machine is in motion. The cylinder axle and rubber, may be made either of similar or dissimilar metals; dissimilar metals are however recommended as most advantageous.

WILLIAM H. SMITH.

Witnesses:
HENRY STONE,
ARTHUR S. MCINTIRE.