

J. BOWMAN & A. CHAPMAN.

Drier for Fertilizers.

No. 159,147

Patented Jan. 26, 1875.

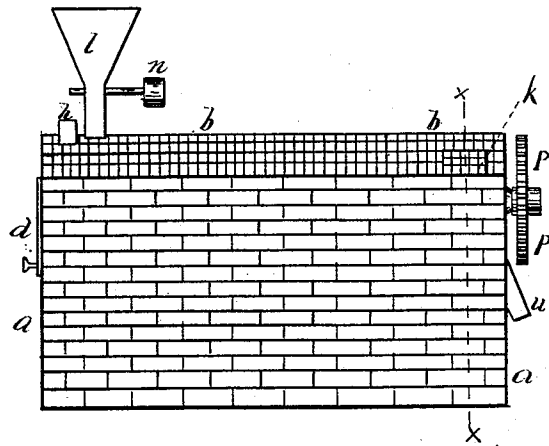


Fig. 1.

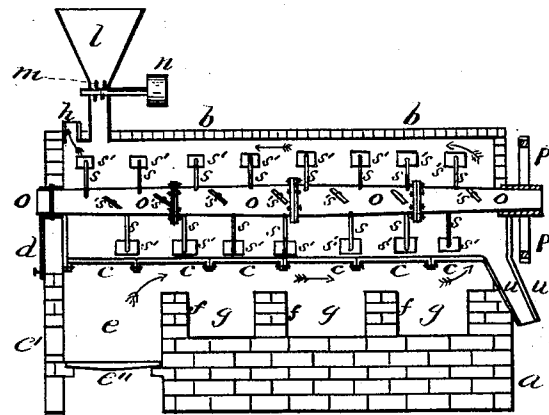


Fig. 2

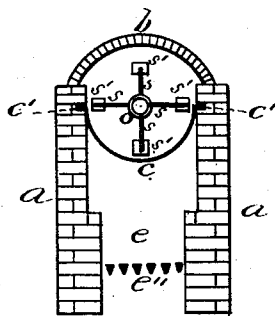


Fig. 3

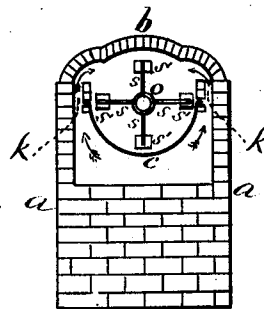


Fig. 4

Witnesses

S. F. Bryant.
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By their Attys.

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UNITED STATES PATENT OFFICE.

JOSEPH BOWMAN, OF WEYMOUTH, AND ALEXANDER CHAPMAN, OF
LOWELL, MASSACHUSETTS.

IMPROVEMENT IN DRIERS FOR FERTILIZERS.

Specification forming part of Letters Patent No. 159,147, dated January 26, 1875; application filed
December 19, 1874.

To all whom it may concern:

Be it known that we, JOSEPH BOWMAN, of Weymouth, in the county of Norfolk and State of Massachusetts, and ALEXANDER CHAPMAN, of Lowell, in the county of Middlesex and State of Massachusetts, have invented an Improved Drier for Producing Fertilizing Compound from Animal Offal, &c.; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The nature of this invention, in detail, is fully described below.

In the accompanying illustration, Figure 1 is a side elevation of a drier embodying our invention. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a transverse section through the combustion-chamber, arch, &c. Fig. 4 is a section through the line *x x*.

Similar letters of reference indicate corresponding parts.

a represents the brick sides and base of the drier. *b* is the arch, also of brick. *c* represents a series of semicircular plates of cast-iron, supported by iron grooves *c'*, Fig. 3, built in the brick-work. These plates, are bolted or riveted together, and are thus constructed so that when any one plate is worn out it may be removed by sliding it out through the door *d* without tearing away the brick-work.

It will readily be seen that the plates nearest the combustion-chamber are exposed to the greatest direct heat, and hence are apt to become burned out more quickly than those more remote, and by making them in sections and removable much expense is saved in replacing them.

e is the combustion-chamber; *e'*, the feed-door to it, and *e''* the grate. By means of the walls *f* chambers or spaces *g* are formed, which hold a large amount of stationary heated air, and serve to keep the heat at a more even temperature than it would be at otherwise, as, for example, if the fire should accidentally become somewhat low, the stationary heat in the chambers *g* would be of assistance in keeping up the temperature. The heat from the

fire in the combustion-chamber passes along over the chambers and walls *g f* to the opposite end of the drier, up through flues *k* upon each side, entering the drier, and passing forward under the arch *b*, and out through the chimney *h*. The drier is fed by means of the hopper *l*, and the offal, &c., is reduced to proper size and shape by the breaker or crusher *m*, which is revolved by means of a belt from a shaft, in connection with the drier, passing around wheel *n*. *o* is a hollow cast-iron shaft, extending from one end of the drier to the other; and actuated by the gear *p*. This shaft *o* is made in sections and bolted together, so that any portion may be removed and replaced. It is also made tapering at its ends and large in the center, in order to prevent warping and to insure greater strength. A number of arms *s*, having shoes *s'* at their ends, are securely attached to the shaft *o*. The shoes *s'* are movable upon their arms *s*, and are intended to carry the contents of the drier toward the end, and to force it out through the discharge-pipe *u*. When the shoes are placed at a greater angle, as the shaft rotates, the fertilizer is passed along more rapidly. When the shoes are placed at a lesser angle the fertilizer moves more closely. The shoes therefore regulate the speed at which the contents of the drier move, and are very important, as some substances require more drying than others.

Having thus fully described our invention, what we claim, and desire to secure by Letters Patent, is—

1. The combination, with the semicircular sectional cast-iron plates *c*, of the grooves *c'*, substantially as and for the purposes herein specified.

2. The combination, with the hollow sectional tapering shaft *o*, of the arms *s* and shoes or paddles *s'*, substantially as and for the purpose above set forth.

JOSEPH BOWMAN.
ALEXANDER CHAPMAN.

Witnesses:

HENRY W. WILLIAMS,
S. F. BRYANT.