A. CLARKE & L. B. CURTISS.

REELS OR AGITATORS FOR PHOSPHATE OR OTHER DRIERS.

No. 180,415. Patented Aug. 1, 1876.

Fig. 1.

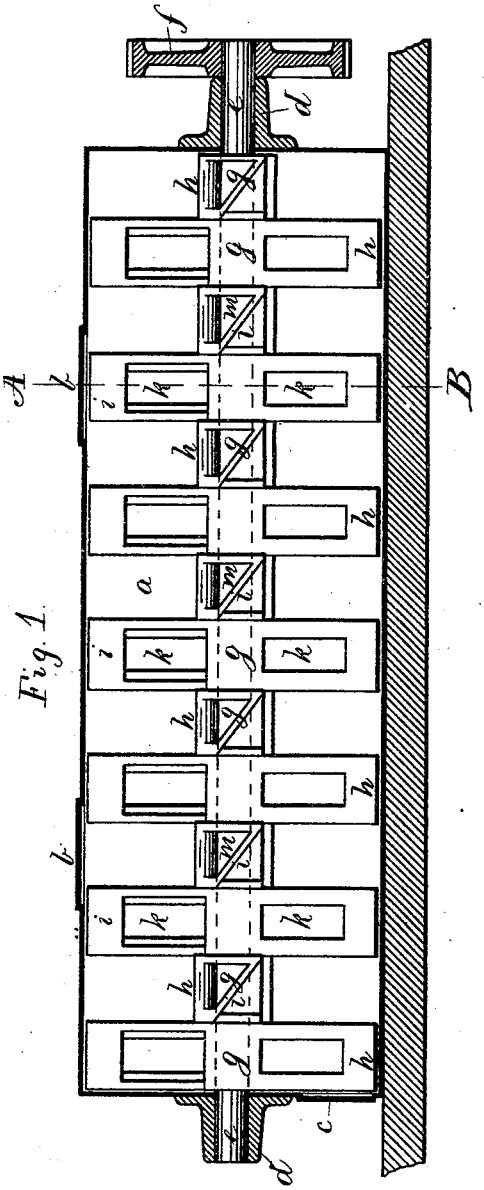


Fig. 3.

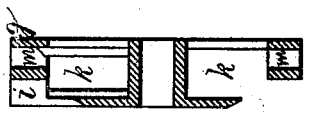
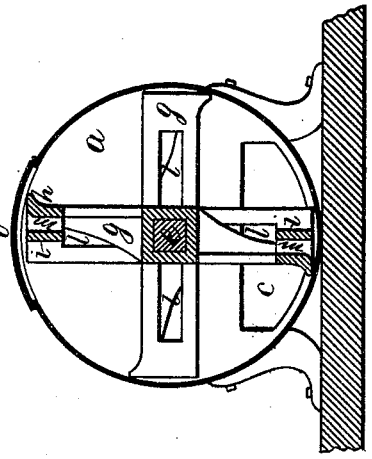


Fig. 2.



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UNITED STATES PATENT OFFICE.

ALFRED CLARKE, OF LEICESTER, ENGLAND, AND LEVI B. CURTISS, OF NORTH WEYMOUTH, MASSACHUSETTS.

IMPROVEMENT IN REELS OR AGITATORS FOR PHOSPHATE OR OTHER DRIERS.

Specification forming part of Letters Patent No. **180,415**, dated August 1, 1876; application filed June 3, 1876.

To all whom it may concern:

Be it known that we, ALFRED CLARKE, of Leicester, England, and LEVI B. CURTISS, of North Weymouth, in the county of Norfolk and State of Massachusetts, have jointly invented certain new and useful Improvements in Reels or Agitators for Phosphate or other Driers; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

Our invention relates to improvements in reels or agitators for phosphate or other driers; and consists of a number of metallic arms secured side by side on a square, round, or polygonal shaft, that is made to rotate in bearings inside of a stationary shell or receptacle containing the article that is to be dried.

The extreme end of each arm or agitator is provided with a face that is parallel with the shaft, and preferably projecting a little forward, and provided with an inclined back. The object of so constructing each arm or agitator is twofold, viz: as the arms are revolved forward, the faces parallel with the shaft dip into the material that is to be dried, and in so doing act like spades, lifting such materials upward during the revolution of the arms, and agitate it thoroughly during the process of drying it. When the motion of the said arms is reversed, which is done when the material in the drier is properly dried, the inclined backs of the arms enter it, and by so doing crowd and force the dried material toward one end of the shell, that may be provided with a door or suitable opening, through which it is allowed to escape, and to be collected in suitable receptacles.

The shell or drier in which our improved agitators are used is heated from below, in the usual manner, and is provided with inlets at the top, through which the drier is filled, as usual.

On the accompanying drawings, Figure 1 represents a side view of our improved agitators. Fig. 2 represents a cross-section on the line A B, shown in Fig. 1; and Fig. 3 represents a longitudinal section of one single agitator.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

a represents the shell or drier, in the usual manner provided with inlet openings *b b*, and an outlet, *c*, in one end. *d d* are the bearings, in which the shaft *e* is set in a rotary motion by means of a gear, *f*, and driving-pinion, in the ordinary way. The shaft *e* is preferably made square inside of the shell or drier, although any other round or polygonal form may be used, if so desired. To the shaft *e* is secured a number of agitators or arms, *g g g*, each one of which is set at a right angle to its neighbor, or nearly so, so that only about half the number of arms are agitating at the same time. Each arm *g* is provided at its ends with faces *h h*, that are parallel with the shaft *e*, for the purpose heretofore set forth, and it is also provided with inclined backs *i i*, for the purpose of forcing the dried material toward and out through the opening *c*, when the motion of the arms is reversed. Each face *h h* is preferably slightly projecting forward, as shown in Fig. 2, for the purpose of more effectually agitating the material that is to be dried.

To insure lightness with strength, the agitators are made in a skeleton manner, being for this purpose provided with openings *k k l l* in the sides, and with the openings *m m* in the ends, as fully shown in the drawings.

As each arm or agitator is secured to the shaft *e* independent of its neighbors, it will readily be seen that in case one arm should get broken, or otherwise damaged, it can easily and cheaply be replaced without repairing the whole of the reel, as is ordinarily the case in other kinds of agitators.

We are aware of the Patents granted, respectively, to G. W. Rawson, April 18, 1870, No. 176,351; to C. Whittier, October 7, 1873, No. 143,482, and to Wm. L. Bradley, January 14, 1873, No. 134,844, and we do not wish to claim anything as set forth and described in said patents as our invention; but

What we wish to secure by Letters Patent, and claim, is—

In combination with the drum or cylinder *a* and its metallic shaft *e*, one or more independent arms or agitators, *g g g*, provided with parallel faces *h h h*, for the purpose of agitating the material during the rotation of the shaft *e*, and having inclined backs *i i i*, for the purpose of forcing the material out through the cylinder *a* when the rotation of the shaft is reversed, substantially as herein set forth and described.

In testimony that we claim the foregoing as our own joint invention we have affixed our signatures in presence of two witnesses.

ALFRED CLARKE.
LEVI B. CURTISS.

Witnesses:
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