

C. L. GALSCHIÖT.

APPARATUS FOR COOLING CEMENT CLINKER OR OTHER GRANULAR MATERIALS.

(Application filed July 8, 1901.)

(No Model.)

Fig. 1.

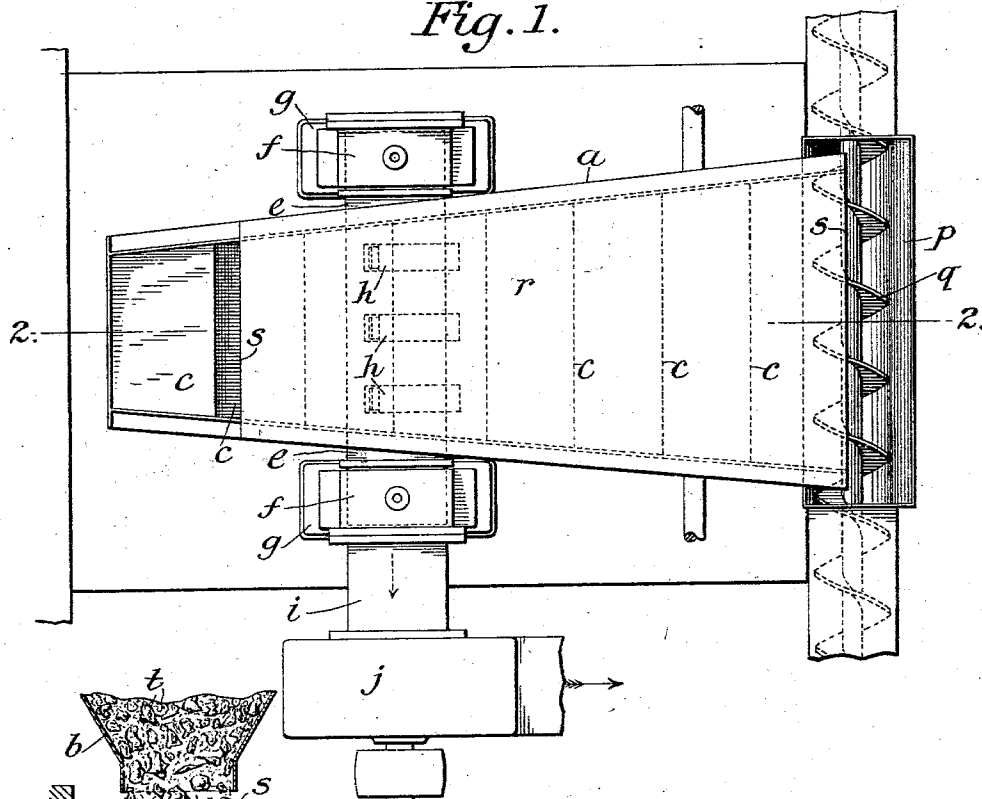
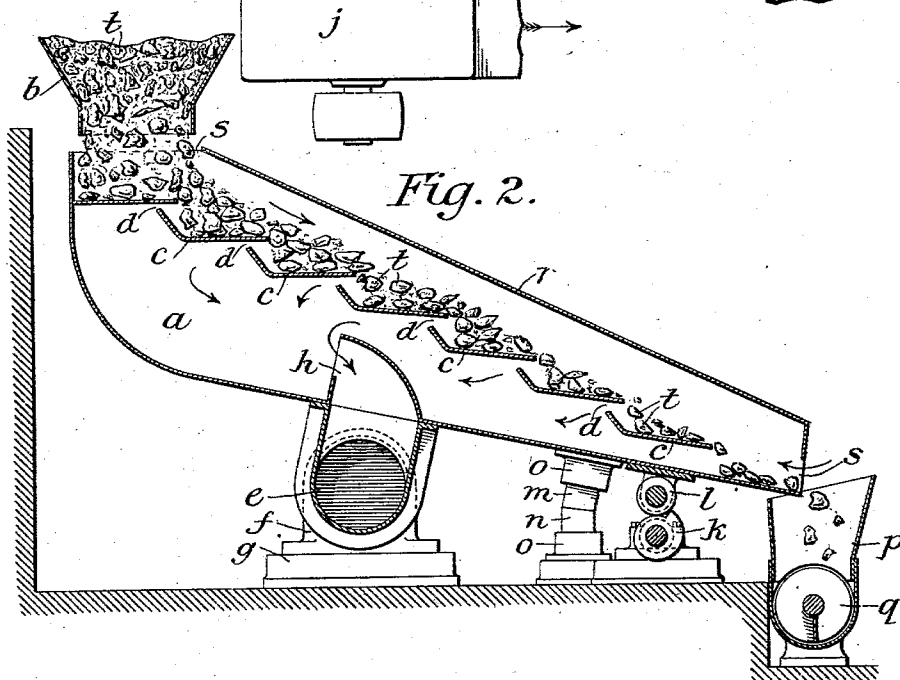


Fig. 2.



Attest:

A. N. Jesbera
J. M. Scoble

Inventor.

Christian Ludwig Galschiöt
by Redding Kiddle Greeley.
Attys.

UNITED STATES PATENT OFFICE.

CHRISTIAN LUDWIG GALSCHIÖT, OF COPENHAGEN, DENMARK.

APPARATUS FOR COOLING CEMENT CLINKER OR OTHER GRANULAR MATERIALS.

SPECIFICATION forming part of Letters Patent No. 694,958, dated March 11, 1902.

Application filed July 8, 1901. Serial No. 87,414. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN LUDWIG GALSCHIÖT, a subject of the King of Denmark, residing at Copenhagen, Denmark, have invented certain new and useful Improvements in Apparatus for Cooling Cement Clinker or other Granular Materials, of which the following is a specification.

The invention consists in passing the material to be cooled over an incline while being subjected to a current of air and simultaneously agitating the material so that same will be cooled uniformly.

The invention also consists in the other new and novel features of construction and combination of parts hereinafter set forth and claimed.

In the accompanying drawings, Figure 1 is a plan view of the apparatus. Fig. 2 represents a longitudinal vertical section thereof on the line 2 2 of Fig. 1.

The material to be cooled is supplied to the top of the receptacle or cooling-box *a* from a suitable spout or hopper *b*. The top of the receptacle comprises a series of steps *c*, arranged along a flat curve approximating an inclined plane. The lower steps are progressively inclined with respect to each other, so that the inclination of the steps, together with the movement of the receptacle, will cause the particles of the material to travel over same. Preferably the steps are formed of separate pieces that are arranged to provide an opening *d* between adjacent steps; but it is obvious that the steps may be formed from a single piece provided with suitable openings, if so desired. The openings are placed so as to permit the passage of air, but to prevent the particles of clinker from passing therethrough. The receptacle is secured to a hollow shaft *e*, rotatable in bearings *f*, provided in pillars *g*. Said shaft is provided with one or more ports or inlets *h*, that communicate with the interior of the receptacle. An exhaust-pipe *i*, connected with a fan *j*, communicates with the central opening of the shaft, so that the air in the interior of the receptacle can be exhausted therefrom. The receptacle is rocked by a rotatable cam *k*, that engages with the receptacle or with a roller *l*, journaled thereon, preferably at or near its

lower end. A block *m* is also secured to the bottom of the receptacle, that engages with a corresponding block *n*, that is held in a suitable support *o*. Said blocks are arranged to contact with each other when the receptacle is rocked by the cam, and thereby jar the receptacle, so as to cause the particles of the material to move. A hopper *p*, provided with a worm *q*, may be provided at the end of the receptacle to receive the clinker after same has passed over the incline and remove same to any convenient point. If desired, a cover *r*, leaving openings *s* at both ends to permit the passage of air, may be placed over the top of the receptacle.

The material *t*, having been supplied to the top of the incline by means of the hopper *b*, is caused to travel over and down the steps, a part of which are arranged so as to have a progressively-increasing inclination by the rocking of the receptacle. The jar which results from the contact of the blocks *m* and *n* with each other when the receptacle is rocked aids in causing the material to travel over the steps and also causes the particles of the material to change position with relation to each other, so that all of the particles shall be equally exposed to the air. A constant circulation of air is maintained about the material as it travels over the steps by means of the fan *j*, which exhausts the air from the interior of the receptacle, and thus draws the air through the openings in or between the steps. By this construction the material can be completely and uniformly cooled in a relatively short space of time and without being spread over a large area. It is obvious that the air which is heated by contact with the material may be utilized in connection with heating a furnace or for other purposes, if desired. Various other changes within the skill of the mechanic may be made in the construction herein described without departing from the spirit of the invention, provided the means set forth in any of the following claims is employed.

I claim as my invention—

1. In an apparatus for cooling cement clinker or other granular materials, the combination of a pivoted incline provided with openings intermediate of its ends to permit a cur-

rent of air to pass through the clinker whereby same is cooled while passing down the incline, and means for rocking said incline.

2. In an apparatus for cooling cement clinker or other granular materials, the combination of a pivoted incline comprising a plurality of steps arranged on a curve and provided with openings to permit a current of air to pass through same, two or more of said steps being progressively inclined with respect to each other, and means for rocking said incline.

3. In an apparatus for cooling cement clinker or other granular materials, the combination with a pivoted incline comprising a plurality of steps and provided with openings to permit a current of air to pass through same, of means for rocking and jarring said incline to cause the material to pass over same.

4. In an apparatus for cooling cement clinker or other granular materials, the combination of a pivoted incline comprising a plurality of steps to carry the material and provided with openings to permit a current of air to pass through same, said openings being arranged to prevent the material from passing therethrough, and means for rocking said incline.

5. In an apparatus for cooling cement clinker or other granular materials, the combination of an air-tight receptacle having a perforated inclined top to carry the material, means for exhausting the air from the receptacle to draw a current of air through the perforations into the receptacle and about

the material on the incline, and positively-actuated means for moving the material to be cooled over and down the top of the receptacle.

6. In an apparatus for cooling cement clinker or other granular materials, the combination of a receptacle secured to a shaft rotatable in suitable bearings and provided with an opening communicating with the interior of the receptacle, an inclined top for said receptacle provided with openings to permit air to pass into the receptacle, means to exhaust the air from the receptacle, and means for rocking said receptacle.

7. In an apparatus for cooling cement clinker or other granular materials, a receptacle provided with a top comprising a series of steps arranged on a curve to carry the material to be cooled and provided with air-passages to permit the air to enter the receptacle, means for exhausting the air from the receptacle so as to produce a current of air through the material on its top, and means for jarring the receptacle so as to cause a movement of the material in relation to itself and also a movement of transmission on the steps.

In testimony whereof I sign this application, in the presence of two witnesses, this 15th day of June, 1901.

CHRISTIAN LUDWIG GALSCHIÖT.

Witnesses:

POOL T. LINDHORD,
J. C. JACOBSEN.