

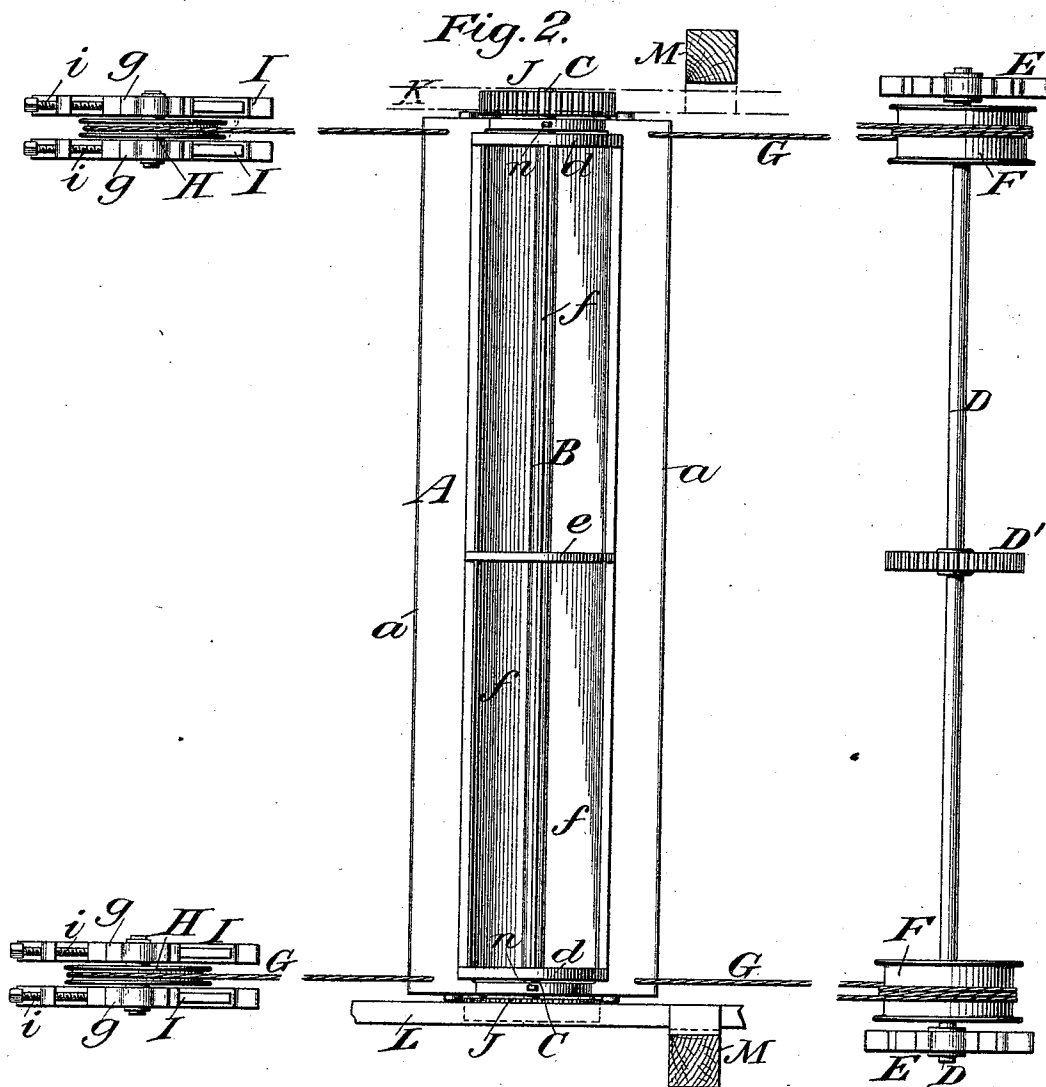
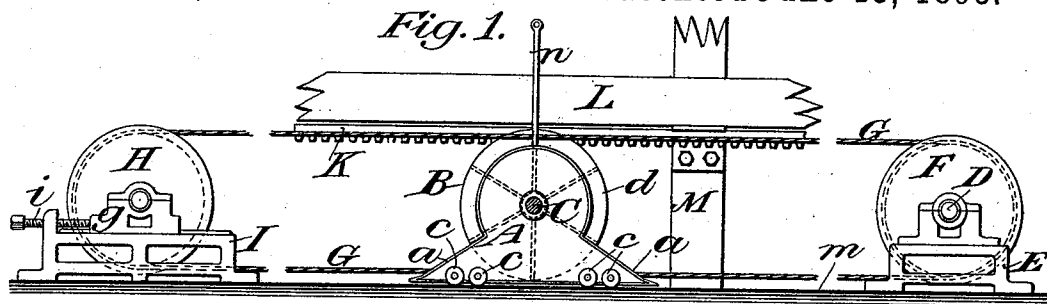
(No Model.)

2 Sheets—Sheet 1.

J. F. DE NAVARRO.
APPARATUS FOR TURNING OVER CEMENT.

No. 499,391.

Patented June 13, 1893.



Witnesses:-
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Inventor:-
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Fig. 3.

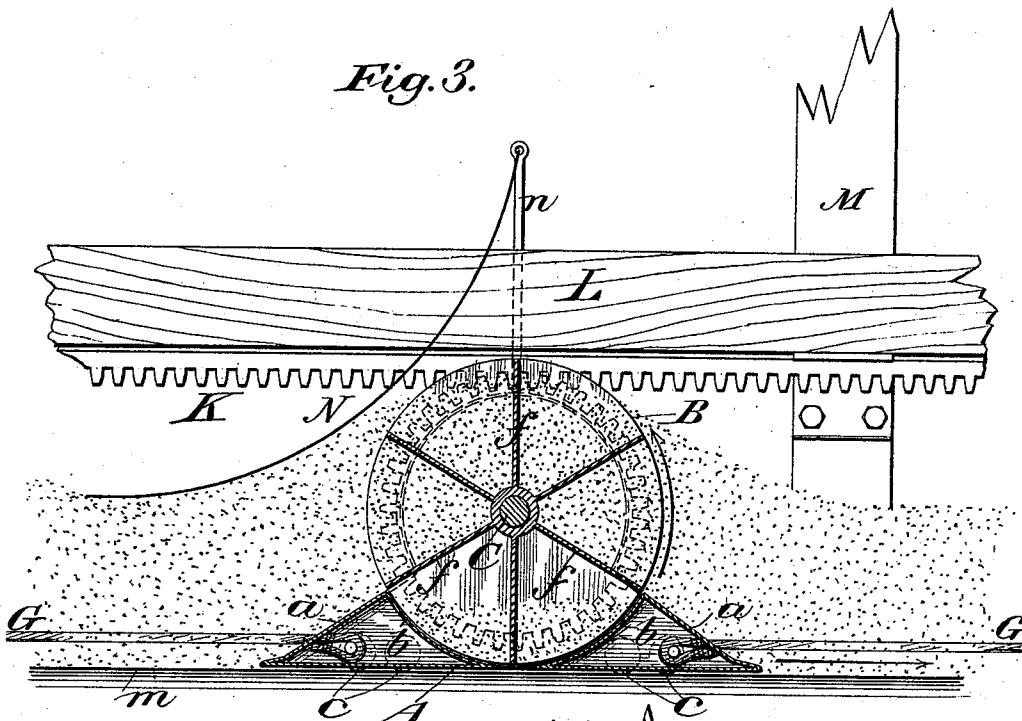
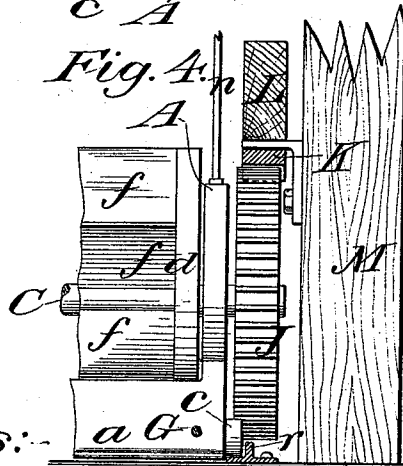


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOSÉ F. DE NAVARRO, OF NEW YORK, N. Y., ASSIGNOR TO ALFONSO DE NAVARRO, OF SAME PLACE.

APPARATUS FOR TURNING OVER CEMENT.

SPECIFICATION forming part of Letters Patent No. 499,391, dated June 13, 1893.

Application filed October 19, 1892. Serial No. 449,325. (No model.)

To all whom it may concern:

Be it known that I, JOSÉ F. DE NAVARRO, a resident of the city of New York, in the county and State of New York, have invented a new and useful Improvement in Apparatus for Turning Over Cement and other Pulverulent and Granular Substances, of which the following is a specification.

The object of this invention is to effect the repeated turning over of cement or other pulverulent or granular substances which are spread upon a suitable surface for the purpose of exposing their particles to the action of the air or of heat but it is especially intended to effect the cooling and, as it is variously termed, the "curing" or "aerating" of cement after it has been burned in a state of powder and while spread under cover upon a floor or upon the ground.

I will proceed to describe my invention in detail and afterward point out its novelty in claims.

Figure 1 is a side view of an apparatus embodying my invention. Fig. 2 is a plan of the same. Fig. 3 represents a vertical sectional view of the principal operative parts of my apparatus on a larger scale than Figs. 1 and 2. Fig. 4 is a view corresponding with Fig. 3 taken at right angles thereto, showing certain of the details.

Similar letters of reference designate corresponding parts in all the figures.

A is a carriage and B a bucket wheel the shaft C of which is fitted to turn in bearings in the sides of said carriage. The said carriage and wheel may be of any suitable width but will generally be, as represented, of a width in the direction of the length of the shaft C, equal to several times the length of the carriage. The parts *a a* of said carriage presented before and behind the bucket wheel, or in other words the front and rear of said carriage, are constructed as spade-like projections (see Figs. 1 and 3) of which the faces are inclined downward from the wheel to the bottom of the carriage where they terminate in thin edges as shown, the said edges being almost close to the floor *m* on which the material to be operated upon is to be spread. Between these projections *a a* is a curb *b* which conforms to the circumference of the

bucket wheel so that the edges of the buckets *f* of the latter may work as nearly as practicable closely within the said curb. The said carriage is represented as mounted upon small wheels or rollers *c* at its sides and for these wheels or rollers rails may be provided as shown in Fig. 4, where one such rail *r* is shown in section. The bucket wheel is represented as having two circular heads *d* and as having a central disk *e* for the purpose of sustaining the buckets which should preferably be flat and radial to the shaft and should have their inner edges in close connection or contact with the shaft or with a hub which extends the whole way between the heads *d*. At one end of the track or way provided for the travel of the said carriage A back and forth, is a transverse driving shaft D supported in bearings in fixed standards E E. On this shaft are secured two pulleys F F around which run respectively two ropes or chains G G which also run round idler pulleys H H which are mounted in bearings *g g* at the opposite end of said way or track. The ends of these ropes are secured respectively to the carriage at the corners thereof. The distance between the driving pulleys F F and their respective idler pulleys H H and the length of the ropes G G is generally intended to be somewhat greater than the intended length of the run of the carriage. This length may be equal to several times the width of the carriage taken in the direction of the axis of the bucket wheel. For the purpose of turning cement the carriage may be sixteen feet wide and the length of run of said carriage may be one hundred feet more or less. In order to provide for bringing and keeping the ropes to a proper tension, the bearings *g g* provided for the idler pulleys are made adjustable on fixed standards I I by means of screws *i*. The driving shaft D is represented as furnished with a spur gear D' through which it may receive rotary motion in either direction from any suitable motor.

On either end of the bucket wheel shaft C outside of the carriage A, is secured a spur gear *j* to run in an inverted stationary horizontal toothed rack K. The rack or racks K may be supported in any suitable manner, but one of them is represented as secured to

the under side of a girder L which is to be carried by any suitable upright supports as for instance the posts M which support the building under cover of which the apparatus is intended to work.

By turning the shaft D in one direction or the other, the pulleys F F are caused to move the ropes G in one direction or the other and so produce the movement of the carriage in either direction between the pulleys F F and H H. In this movement of the carriage the spur gears J running in the stationary racks K are caused to produce rotary motion of the bucket wheel, the motion of the wheel always being upward on that side which is presented in the direction in which the carriage is running.

In now describing the operation of the apparatus I will first suppose the carriage to be at one end of its track, say that next the idler pulleys. The cement or material to be treated is then spread to a suitable depth over the whole of the floor space or ground included within the length and width of the track. Rotary motion is then communicated to the shaft D through the gear D' in a direction to draw the carriage and the bucket wheel toward the said shaft. The spade-like projection *a* which is presented toward the said shaft then gathers up the material in front of it in such manner that it is picked up by the buckets of the wheel and is by the rotary motion of the latter thrown completely over to the rear of the carriage. In being so picked up and thrown over fresh parts of the material are exposed to the action of the air. When the carriage has completed its run in the direction mentioned, the rotary motion of the shaft D is reversed and the carriage returns and the bucket wheel is thereby caused to repeat the operation of turning over the material and giving a fresh exposure to the air. The carriage and the bucket wheel may run back and forth in this way until the op-

eration of turning over the material and giving fresh exposure of it to the atmosphere has been repeated a sufficient number of times required for its complete curing, aerating or cooling.

For the purpose of preventing the pulverized material from flying as it is thrown over by the bucket wheel I may employ, as shown in Fig. 3, an apron or curtain N consisting of a sheet of canvas or other flexible material suspended at its upper edge from uprights erected on the carriage. This curtain is turned in one direction or the other over the bucket wheel and carriage according to the direction in which the carriage is moved, so that it always hangs behind the bucket wheel.

What I claim as my invention is—

1. The combination of a reciprocating carriage having inclined spade-like projections presenting their edges outward in opposite directions, a bucket-wheel mounted in said carriage between said spade-like projections and a curb in said carriage conforming to the circumference of the said bucket wheel, substantially as and for the purpose herein set forth.

2. The combination of a carriage having inclined spade-like projections presented in opposite directions and an intervening curb, a bucket wheel mounted in said carriage, a driving shaft and a pulley thereon, ropes or chains running on said pulley and connected with said carriage for drawing it back and forth, a gear on said bucket wheel and a stationary rack with which said gear engages for producing the rotation of said wheel in opposite directions by the movement of the carriage back and forth, all substantially as herein set forth.

JOSÉ F. DE NAVARRO.

Witnesses:

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