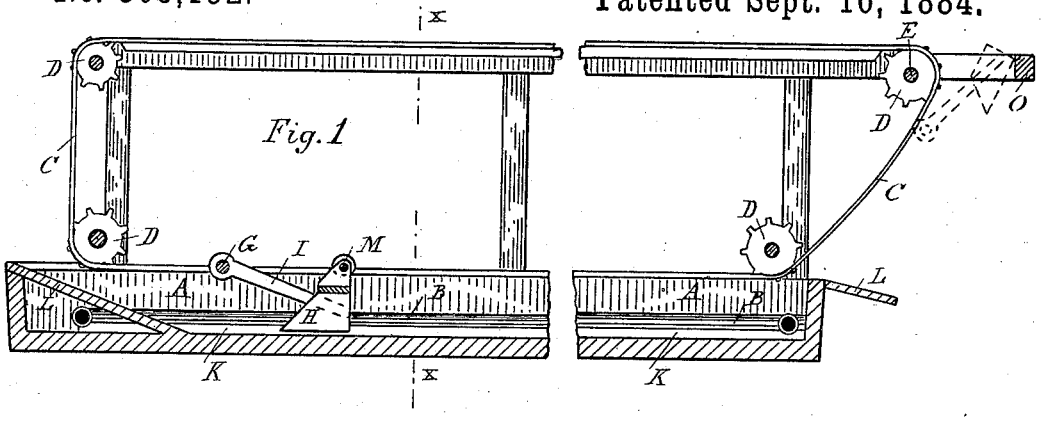
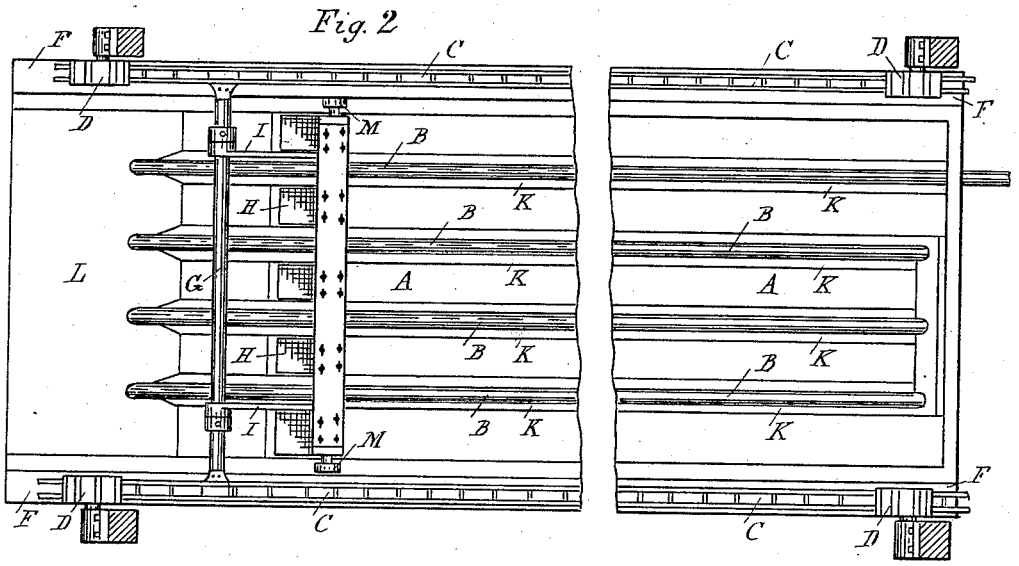
(No Model.)

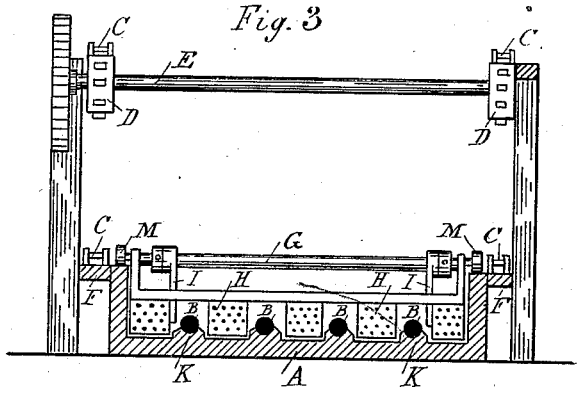
T. CRANEY.

SALT GRAINER.

No. 305,152. Patented Sept. 16, 1884.







Attest
J. Paul Mayer
E. Scully.

Inventor
Thomas Craney
By Thos. S. Sprague Atty

UNITED STATES PATENT OFFICE.

THOMAS CRANEY, OF BAY CITY, MICHIGAN.

SALT-GRAINER.

SPECIFICATION forming part of Letters Patent No. 305,152, dated September 16, 1884.

Application filed March 26, 1884. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CRANEY, of Bay City, in the county of Bay and State of Michigan, have invented new and useful Improvements in Salt-Grainers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to a device for removing the salt from the grainer and carrying it to its place of deposit; and the invention consists, first, in the use of buckets in combination with an endless carrier which carries the buckets through the grainer in such manner that the buckets will scoop up the salt from the bottom of the grainer; second, in the peculiar construction of the buckets which allows of the draining off of the salt; and, thirdly, in the arrangement of the endless carrier in combination with devices for carrying the salt to its place of deposit, or to the conveyer, and dump it there from the buckets.

In the accompanying drawings, which form a part of this specification, Figure 1 is a longitudinal vertical section through a grainer provided with my device for collecting and carrying the salt. Fig. 2 is a plan view of the same, and Fig. 3 is a cross-section of the same on line *x x*.

A is an evaporating-pan, or so-called "grainer," of known construction.

B is a horizontal coil of steam-pipes placed at or near the bottom of the grainer, and provided with a steam inlet and outlet, as shown.

C are endless chains passing over a system of sprocket-wheels, D, which are supported in any convenient manner, so that the chains are free to travel in a vertical plane on each side of the grainer. Two corresponding sprocket-wheels are connected with a shaft, E, by means of which motion is communicated to the chains from any source of power. The lower stretches of the chains are supported and travel upon horizontal stringers F, which are on or about on a level and outside and parallel to the sides of the grainer. The upper stretches of the chains may be supported in a like manner.

G is a cross-bar secured upon its ends to the chains C.

H H are a series of scoops or buckets, either connected together into one system, which is pivotally secured to the cross-bar by means of the arms I, or each scoop is independently pivoted to the cross-bar in like manner. These scoops are made of non-corrosive material, with their bottom, and preferably with their sides, perforated, and are of proper dimensions to fit in the spaces between the steam-pipes and the steam-pipes and the sides of the grainer. The steam-pipes are preferably placed as near to the bottom as convenient, and upon their sides they are provided with deflectors K, by means of which the salt, when precipitated to the bottom of the grainer, is collected between the pipes. One or both ends of the grainer are provided with or form inclined planes L, to allow the chains when in motion to freely carry the scoops into and out of the grainer.

To prevent the scoops producing impurities in the salt, owing to abrasion by wearing on the bottom of the grainer, I prefer to fix a shoe, M, on either end of the series of scoops, so that they may be made to travel upon the sides of the grainer and lift the scoops slightly off from the bottom.

In practice a slow and continuous motion is communicated to the chains, which slowly drag the scoops through the brine. This motion produces the required agitation, and the scoops at the same time collect all the precipitated salt. In striking the incline at the rear end of the grainer the scoops, together with the collected salt, are carried out of the brine, and, owing to the change of direction in the run of the chains C, the scoops are now vertically suspended from the cross-bar G, and are carried in this position toward the other end. While they are thus carried slowly overhead the grainer the brine in the scoops has ample time to drain off through the perforation in the scoops. As soon as the scoops or the arms by means of which they are pivoted to the cross-bar strike the shaft E, they are arrested in their motion, and, owing to the downward change in the direction of the moving chains, they are forced to vault over the shaft E. A bar, O, so placed across their path that the scoops will strike it before they have completed their vault, will so forcibly arrest them that the salt is completely shaken or dumped out of them, falling either on a plat-

form underneath or direct into the conveyer-trough. The continued motion of the chains then carries the scoops again into the grainer, and their operation begins anew.

It is clear that the length of the carriers C is not limited by the length of the grainer. In fact they may be made long enough to carry the salt to any distance in the direction of the grainer. Thus the device constitutes a salt-carrier, and the collecting of the salt of a whole salt-block may thus be carried on wholly by mechanical devices, doing away with a great deal of manual labor now required. If one system of scoops for one grainer is not found sufficient, two or more may be used, according to its length, and it is immaterial whether the scoops secured to one cross-bar G are connected together or whether they are individually pivoted; or they may be secured to separate cross-bars distributed along the chains, so as to make the load upon the chains more even.

I am well aware that the system herein described may be easily modified in regard to the arrangement of the carrier-chains, as one, two, or more may be used to effect the proper movement of the scoops or buckets; still I prefer the use of two chains or ropes arranged upon either side of the grainer and outside thereof, as there is less liability for iron-rust or other impurities to fall into the grainer.

The deflectors K are of great service to prevent the scoops from rubbing against the steam-pipes.

What I claim as my invention is—

1. In a device for collecting and carrying the salt from the grainers, the combination of a system of scoops with an endless carrier so arranged that the scoops can enter into the grainer at one end, and, after scooping the salt from its bottom, leave the grainer at the other end, and carry the salt to a place of deposit at the end of the grainer at which they entered, substantially as set forth.

2. In a device for collecting and carrying the salt from the grainers, in combination with a series of scoops pivotally secured to endless carriers, the bar O, placed in the path traveled by said scoops, constructed and arranged to arrest their motion as they are passing over one of their supporting-shafts, whereby a jar is given to the scoops to dump their contents, substantially as described.

3. In a device for collecting and carrying the salt from the grainer, substantially as described, the endless carriers C, provided with scoops D, constructed to collect the salt from the bottom of the grainer and carry it over the grainer to the end of the grainer at which they entered, said scoops being provided with perforated bottoms to allow the brine to drain off, substantially as and for the purpose specified.

THOS. CRANEY.

Witnesses:
H. S. SPRAGUE,
E. SCULLY.