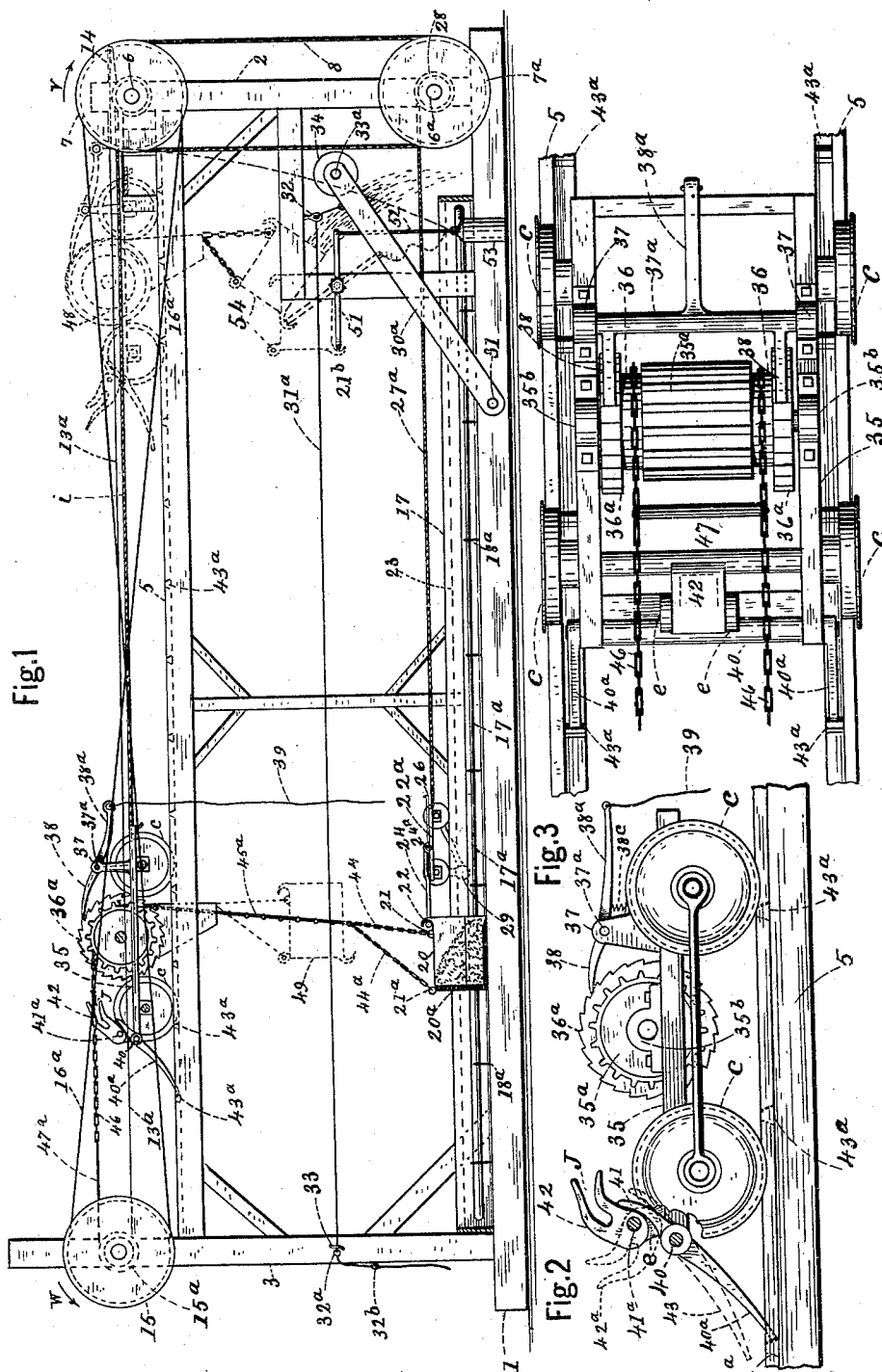


N. S. SCOVILLE.
SALT GRAINER.

No. 473,560.

Patented Apr. 26, 1892.



Witnesses.

J. M. Caldwell.
H. C. Ashbery

Nathaniel S. Scoville, Inventor
By James Sangster, Attorney.

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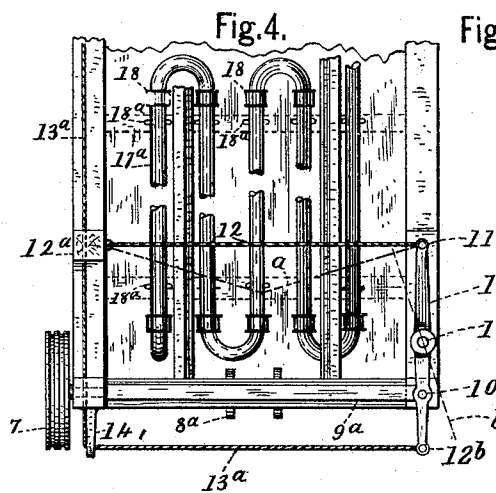


Fig. 4.

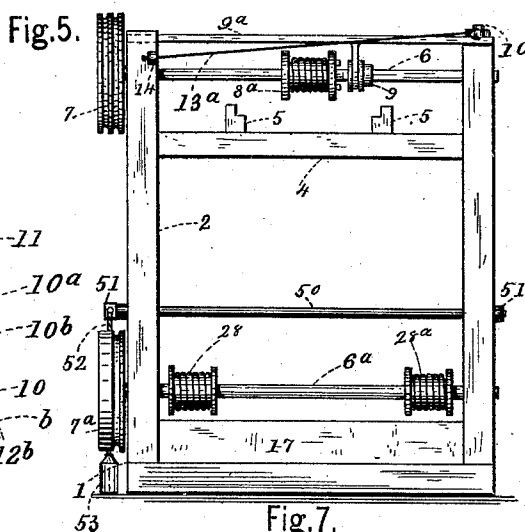


Fig. 5.

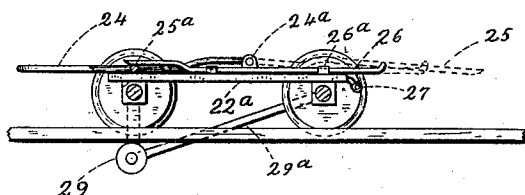


Fig. 6.

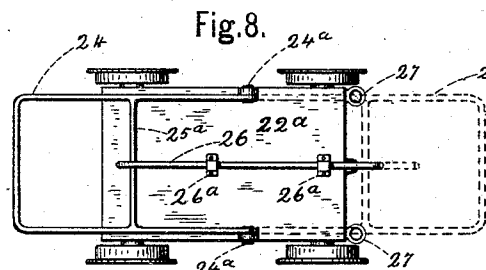


Fig. 7.

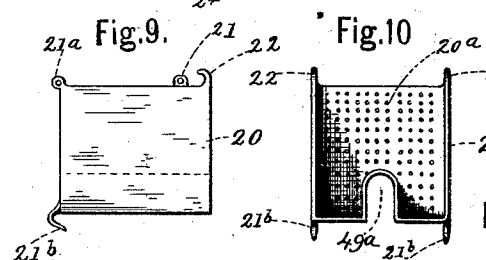


Fig. 8.

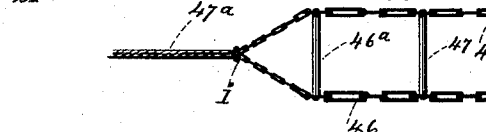


Fig. 9.

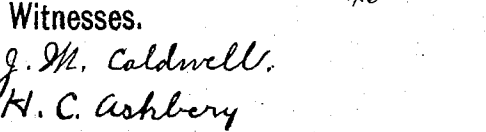


Fig. 10.



Fig. 11.

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UNITED STATES PATENT OFFICE.

NATHAN S. SCOVILLE, OF WARSAW, NEW YORK.

SALT-GRAINER.

SPECIFICATION forming part of Letters Patent No. 473,560, dated April 26, 1892.

Application filed May 6, 1891. Serial No. 391,765. (No model.)

To all whom it may concern:

Be it known that I, NATHAN S. SCOVILLE, a citizen of the United States, residing in Warsaw, in the county of Wyoming and State of New York, have invented certain new and useful Improvements in Salt-Grainers, of which the following is a specification.

My invention consists in certain improvements in salt-grainers, and will be fully and clearly hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved apparatus partly in section. Fig. 2 is a detached side elevation of the lifting and carrying carriage. Fig. 3 is a top plan view of the same. Fig. 4 is a top plan view of the front end of the frame-work, showing also a plan of a portion of the salt-vat and the arrangement of the steam-heating pipes below the frame-work. Fig. 5 is a front end view of the frame-work, pulleys, winding-drums, and their connecting parts. Fig. 6 is a side elevation of the carriage for drawing the scoop forward and causing it to fill or partly fill with salt while passing through the vat. Fig. 7 is a rear end view of the frame-work, the vat, the pulley and shafting, the winding-drum, and device for starting or stopping the action of the winding-drum. Fig. 8 is a top plan view of the carriage shown in Fig. 6. Fig. 9 is a side elevation of the scoop. Fig. 10 is a front view of the same, showing the perforated back. Fig. 11 is a detached top plan view of the chain and chain-gear for carrying and raising the scoop, as will be more clearly hereinafter shown.

In said drawings, 1 represents the base-frame of the apparatus.

2 is the front end frame, and 3 the rear end frame.

To the front and rear end frames is firmly secured a cross-beam 4, upon which the railway-track 5 is supported. On the front frame-piece 2 is mounted two transverse shafts 6 and 6^a, to which is rigidly secured the large pulleys 7 and 7^a, both connected by a belt or cable 8, (shown in Fig. 1,) so that both run in the same direction in the direction of the arrow V. (See Fig. 1.) The upper shaft 6 is also provided with a winding-drum 8^a, (shown in Figs. 4 and 5,) loosely secured thereto in any well-known way, and to one side of it is an ordinary toe-clutch 9, (see Fig. 5,) arranged

so as to slide upon a feather, so as to turn with the shaft. It is operated to be engaged with or disengaged from the winding-drum 8^a by means of mechanism substantially as follows: At the top of the frame is a longitudinally-movable bar 9^a. (See Figs. 4 and 5.) One end of the bar 9^a passes into a hole in the post at the side of the frame next to the pulley 7, and its opposite end is pivoted by a pin 10 to an arm 10^a, which is pivoted by a bolt or pin 10^b to the top of the frame, so that as the arm 10^a is made to turn back and forth on the pin 10^b it causes the bar 9^a to move longitudinally back and forth and the toe-clutch to be either engaged with or disengaged from the drum. At the inner end of the arm 10^a (see Fig. 4) is secured a rope or cable 12, having its opposite end secured to a post 12^a on the opposite side of the frame. The outer end 12^b of the arm 10^a is also connected with a rope or cable 13^a. This cable or rope 13^a passes therefrom to the other side of the frame and through a hole in a piece 14, projecting from the frame, and from thence through the frame-post, and then to the opposite end of the frame or to the portion 3 to within a convenient reach of the operator. (See Figs. 1, 4, and 5.) Now from the above construction it will be seen that a pressure against the center of the rope or cable 12, so as to bring it to the position substantially as shown by the dotted lines *a* in Fig. 4, will turn the arm 10^a into the position shown by the dotted lines *b* in said Fig. 4, and thereby disengage the winding-drum 8^a, so that it runs loose on the shaft without being turned with it, and when it is desired to start said winding-drum all that is necessary to do is for the operator to pull on the rope or cable 13^a, when the clutch is brought into engagement with the winding-drum and the rope or cable 12 is again drawn taut, as shown in Fig. 4. The object of this construction will be explained further on. At the opposite or rear frame 3 (or rear end of the frame-work) is mounted on a transverse shaft 14^a a large pulley 15, and near the center of the frame is a winding-drum 15^a, loosely fitted to the shaft 14^a, upon which is also fitted a toe-coupling 15^b, (see Fig. 7,) and a pivoted arm 16, pivoted to the top beam for moving one part of the toe-coupling in the usual way to and into engagement therewith or disengaging it therefrom, so as to stop or start the winding-drum. The large

pulley 15 is connected with the large pulley 7 by a cross belt or cable 16^a, (see Fig. 1,) and is also connected by a belt with any suitable source of power for driving it. This cable 16^a may be either the well-known wire cable, which is preferred, or it may be a belt or any other well-known means for connecting the two pulleys. I have therefore designated this cable or belt by a single dark line in order to avoid confusion in the number of lines shown at that part of the drawings in Fig. 1.

Below the upper portions of the framework is located a vat 17, extending a hundred feet, more or less, and about twelve feet wide and two feet deep, or thereabout. It is provided with a series of pipes 17^a, joined at the ends by connections 18 (see Fig. 4) of about six inches diameter, and are sustained in position about six inches from the bottom by supports 18^a at the bottom of the grainer, or by any well-known suitable means. (See Fig. 4, also Fig. 1.) These pipes are supplied with steam in any suitable or well-known manner for heating them. This vat is constructed of the usual materials and in the ordinary way for adapting it to hold the salt and water. Within this vat 17 is a large scoop 20, adapted to be moved longitudinally forward along the vat while being filled with salt. It is provided with a series of perforations 20^a in the back. (See Figs. 1, 9, and 10, where different views of this scoop are shown.) To each side of this scoop is a ring or eye 21. At the front and at the rear sides is an eye or ring 21^a, by which it is suspended by chains, as will be more clearly hereinafter shown, and at the lower rear ends are two tipping-hooks 21^b. At the top of the front of the scoop is also attached two hooks 22, by which it is drawn forward by the carriage 22^a. This carriage 22^a (see Figs. 1 and 8) is adapted to run on a track 23, located at the top of the vat, and is provided with a pivoted frame or bail 24. This bail 24 is pivoted to the top of the carriage 22^a at or about the point 24^a, (see Figs. 1, 6, and 8,) so that it can be turned over either to the front to catch the hooks 22 of the scoop or to release the scoop and be turned back out of the way, as shown by the dotted lines 25, Figs. 6 and 8.

Extending across the bail 24 is a cross-bar 25^a, rigidly attached to or formed in one part with it, and on the top of the carriage 22^a is a sliding bolt 26, secured in place by caps 26^a, so as to be easily moved longitudinally back and forth. At the front of the carriage are two rings 27, rigidly attached thereto, and to these rings ropes or cables 27^a are attached, which pass forward and are connected to the drums 28 28^a. (See Figs. 1 and 5.) After the bail or frame 24 is turned down over the hook 22, as shown in Fig. 1, the bolt 26 is shoved forward, so as to pass over the cross-bar 25^a, and thereby secures the bail or frame 24 down in place, so that the scoop is securely held thereto.

To prevent the carriage 22^a from being

lifted up from the track, I employ a small wheel 29, secured by a bar with the front axle and by a diagonal bar 29^a secured to the rear axle. There are two wheels 29, one on each side of the carriage, and they roll against the under side of the overhanging portion 30 of the said track. (See Fig. 7.)

The cable 8 runs in grooves in the pulleys 7 and 7^a and is fitted loosely on said pulleys. On the side of the base-frame piece is a beam 30^a, pivoted by a pin 31, so as to swing on said pin. At or near the upper end of the beam is attached a rope 31^a, which passes up through a perforated portion 32 and from thence to the opposite end of the frame-work, where it is provided with two knots 32^a 32^b, so that the operator can raise or lower it by pulling on the cord 31^a, and the knots afford the means for securing it in the hook 33 (see Fig. 1) at whichever point it may be adjusted; but any well-known device adapted for this purpose may be used. At the top of the beam 30^a is secured by a pin 33^a a friction-pulley 34. (Shown in Fig. 1.) From this construction it will be seen that the operator has control over the action of the large pulley 7^a, so that he can start or stop it, as he pleases, by putting the tightner on or off.

A car 35 is located on the track 5 and is adapted to be moved along back and forth thereon. (See Figs. 1, 2, and 3.) It consists of the four supporting car-wheels *c* and a bed carrying a sprocket-wheel 35^a, mounted in suitable bearings 35^b thereon. On each side of the sprocket-wheel is a narrow portion 36 of smaller diameter, (shown in Fig. 3,) for purposes which will be explained further on, and on each side of the portions 36 is a ratchet-wheel 36^a, and mounted in bearings 35^b (see Figs. 1, 2, and 3) is a shaft 37^a, having two pawl-arms 38, which engage with the ratchet-wheels 36^a, and projecting out from the opposite side of the shaft 37^a is an arm 38^a, having a cord 39, connected to the end and hanging down to within easy reach of the operator stationed near the salt-scoop. The object of this construction is to hold the scoop suspended at any point while being raised up and to provide the means for releasing it instantly when required by pulling on the rope 39. To keep the pawls always in engagement with the ratchet-wheels when necessary, the two pawls 38 should be heavy enough to overbalance the single arm 38^a and rope attached to it; but, if desired, a spring 38^c (shown in Fig. 2) may be used in addition to the weight of the pawls 38.

At the front of the carriage or car 35 is a horizontal shaft 40, (see Figs. 2 and 3, also Fig. 1,) mounted in suitable bearings on the body of the vehicle, having two downwardly-projecting bars 40^a (or arms) at the front side of the shaft and at the rear upper portion of the shaft, or substantially so, and in or about the center is another shorter arm 41, (see Fig. 2,) and pivoted to suitable supports *e* (shown in Fig. 3) by a pin 41^a is a cam-shaped portion

42, its lower portion being pivoted eccentrically, so that when turned over into the position shown by the dotted lines 42^a in Fig. 2 it will turn the arms or bars 40^a into the position shown by the dotted lines 43 in said Fig. 2, thereby lifting the lower end upward and lifting them up from the projecting teeth or lugs 43^a, which teeth or lugs 43^a are located inside of the track at regular intervals along its whole length. The object of this construction is to provide the means for holding the carriage, so that it cannot be drawn forward while raising the scoop, which is done as follows: To the scoop is secured two chains 44 in the rings 21 at the front, and at the rear in the rings 21^a are secured two more chains 44^a. These chains (which should be sufficiently strong, as the scoop when filled with salt will weigh a half a ton, more or less) are all attached to the end 45 of the sprocket-chain 45^a, (shown in Fig. 11), which is adapted to engage with and run on the sprocket-wheel 35^a. This sprocket-chain is only long enough to permit the scoop to be raised to the required height, and is provided at the upper end with two chains 46, one at each side, (see Figs. 3 and 11,) which run over the smooth reduced portions 36. (Shown in Fig. 3.) At the termination of these chains is a round bar 46^a, (see Fig. 11,) which keeps them apart, and a short distance back of the bar 46^a is another bar 47. (Shown in Fig. 11.) The two chains are united at the ends *i* and connect with a cable 47^a, (shown in Figs. 1 and 11,) which cable winds on the drum 15^a. (Shown in Figs. 1 and 7.) The car 35 is connected by a rope or cable *i* with the winding-drum 8^a. (See Fig. 1.)

The operation of the invention is as follows:
 40 The tightener 34 having been raised up from the belt or cable 8, (by the rope 31^a, as before mentioned,) so that the wheel 7^a, its shaft 6^a, and winding-drums 28 28^a are loose and free to be moved easily either way, and the carriage 35 being in its forward position, substantially as shown by the dotted lines 48, and after the scoop has been relieved of its load of salt and empty and the clutch 9 at the front end of the vat and frame-work being out of engagement with the winding-drum 8^a by the action of the carriage 35 in its forward movement against the rope or cable 12, as above described, so that the winding-drum runs loosely on the shaft 6. The next operation is to throw the clutch 15^b into engagement with the winding-drum 15^a at the rear of the frame-work. This operation causes the drum 15^a to turn and wind up the cable 47^a, and consequently draw the carriage 35 and the elevated scoop 20 back toward the rear of the vat. When back sufficiently far, the winding-drum 15^a is thrown out of gear and the scoop 20 is allowed to come down by the operator at the vat pulling on the rope 39, and thereby disengage the pawls 38 from the ratchet-wheels 36^a. As the scoop comes down, the cross-bar 47 on the double chain 46 is drawn

out of the cam 42, which operation turns it up into the position shown in Figs. 1 and 2, so that the arms 40^a are free to move up or down, and consequently drop down and prevent the carriage from being drawn forward by the lower ends catching one of the teeth or lugs 43^a along the track. While the scoop is descending it is directed by the operator so that the hollow portion 49^a (shown in Fig. 10) in the bottom of the scoop will rest on and over the center steam-heating pipe. (One of the pipes 17^a, see Fig. 4.) The hooks 21^b on the lower rear sides of the scoop are not shown in Fig. 1, for the reason that they are behind the beam or frame 1. The scoop being mounted so as to ride upon one of the steam-heating pipes, is held thereby above the bottom of the vat, so that the hooks 21^b do not at any time come in contact with it. The car 22^a is then brought to the scoop by the operator and the bail 24 turned over forward, so that it falls over the hooks 22. The bolt 26 is now shoved forward over the cross-bar 25^a, thereby holding the bail firmly down and in engagement with the hooks 22 on the scoop. The clutch 9 is now thrown into gear with the winding-drum 8^a and the tightening-pulley 34 let down against the belt or cable 8, which operation throws all the winding-drums 8^a 28 28^a into action, so that the carriage 35, the carriage 22^a, and the scoop 20 move forward simultaneously, the scoop gathering salt as it passes through the salt water, the water passing through the back perforations of the scoop, while the salt is retained therein. When sufficient salt has been gathered into the scoop it is elevated or lifted up with its load, to a position sufficiently high for dumping, by the operator at the rear end of the apparatus throwing the lower winding-drums 28 and 28^a out of gear by pulling the rope 31^a and raising the tightener 34. The clutch 15^b is now thrown into engagement with the winding-drum 15^a, which operation causes the chain 46 to be drawn up over the reduced portions 36 of the carriage and the sprocket-chain to engage with the sprocket-wheel 35^a, and near the time the scoop is sufficiently elevated the cross-bar 47 passes into the camway J and turns the cam 42 in the direction of the dotted lines 42^a, (shown in Fig. 2,) thereby raising the bars 40^a to the position 43, also shown in Fig. 2, in which position the carriage is free to be moved along the track either way, the scoop and its load of salt being sustained in the position substantially as shown by the dotted lines 49 in Fig. 1 by the pawls 38 and ratchet-wheels 35^a; but before proceeding to raise the scoop and its load it is necessary for the operator at the vat to release it from the car or carriage 22^a. This is done by lifting the bail 24 up away from the hooks 22 and turning it over in the position shown by the dotted lines 25 in Figs. 6 and 8. The scoop and load has now to be carried forward and its load dumped into a wagon or other suitable receptacle. This is done by throwing the clutch 8^a into gear by

means of the rope 13^a, as hereinbefore explained. This operation draws the carriage 35 and the loaded scoop forward until the hooks 21^b at the two lower opposite corners at the back of the scoop catch onto the bar 50 (shown in Fig. 5) and forms a part of the pivoted side bar 51, (of which there is one at each side of the frame,) and one or both may be provided with a cord 52 and weight 53, the greater weight being in the forward portion of the bars 51 and their cross-bar 50, and the cord and weight being of the proper length always keep them in a horizontal position, but allows the bar 50 to be turned upward when necessary. As the hooks 21^b catch onto the bar 50 and as the motion of the scoop is continued forward, it turns the ends of the side bars 51, and consequently the bar 50, upward, taking the rear lower side of the scoop up with it until it is substantially in the position shown at 54 in Fig. 1, when the salt flows out into a suitable receptacle. At or about the same time the salt is being dumped the forward movement of the car 35 is stopped automatically by its coming in contact with the cross rope or cable 12 and moving it substantially in the position shown by the dotted lines *a* in Fig. 4, which operation throws the coupling 9 out of engagement with the winding-drum 8^a, as heretofore mentioned, so that the forward movement of the car 35 is arrested automatically at the time required. This operation is repeated as long as there is sufficient salt to be removed. If desired, the scoop may have two or more grooves 49^a, to slide on two or more pipes instead of one.

I claim as my invention—

1. In a salt-grainer, the combination, with a salt-vat having a series of longitudinal heating-pipes in the bottom, of a salt-scoop having a perforated back and a longitudinal groove in the bottom adapted to fit over and slide along one of the heating-pipes, one or more cables connected with winding-drums for drawing it through the vat, and thereby filling it with salt, a chain connecting the scoop with a car located on a track above the vat, and mechanism, substantially as above specified, for raising the scoop when filled and carrying it forward and dumping the load, as described.

2. In a salt-grainer, the combination, with a salt-vat provided with a railway-track, of a salt-gathering scoop provided with hooks, a car adapted to run on said track, provided with a pivoted bail for engaging with the hooks on said scoop or being easily disengaged therefrom, a bolt for holding said bail in engagement with the hooks on the scoop or quickly releasing it, and a cable connected with winding-drums for drawing the scoop forward and filling it with salt, substantially as described.

3. A scoop for gathering salt, consisting of a box-shaped vessel open at the front and top and having a perforated back, hooks se-

cured to the front portion, rings or holding devices located at the top, by which the suspending-chains are secured, hooks located at the lower rear sides, by which the scoop is dumped, and a longitudinal groove on the under side, for the purposes described.

4. In a salt-grainer, a scoop for gathering salt in its forward movement through the salt-vat, open at the front and top and having a series of perforations in the back, hooks to receive a suitable means for drawing it forward, and a longitudinal groove at the bottom adapted to fit over the top and sides of a longitudinal steam-heating pipe located in the vat and along which the scoop is drawn and guided as it moves forward through the vat, substantially as described.

5. In a salt-grainer, a scoop for gathering the salt, having hooks at the lower rear portion, in combination with arms pivoted to the frame-work and carrying a cross-bar, a weight suspended by a flexible cord at the opposite end of the arms, a car located on a railway-track on the top frame for suspending and carrying the scoop, and a cable connected with the car and with a winding-drum for drawing the scoop forward and dumping it, substantially as described.

6. In a salt-grainer, the combination of a car connected by a cable with a winding-drum for moving it one way and by a double chain and sprocket-chain, with a salt-scoop, sprocket and ratchet wheels mounted on said car, pawls for holding or releasing said sprocket and ratchet wheels, a connecting cord or rope for moving said pawls out of engagement with the ratchet-wheels, arms at the front of the car for holding and preventing it from moving when drawing the scoop up, a pivoted cam operated by a cross-bar on the chains for releasing said arms from the track, so that the car can move either way, and a means, consisting of a cable and winding-drum, for drawing the car in the opposite direction, as described.

7. In a salt-grainer, the combination, with the car and mechanism consisting of a cable connected to a winding-drum for moving the car forward, of an arm pivoted substantially centrally to the upper forward end of the frame and having a rope 12, having one end connected to the rear end of the arm and the other end extending across the frame and secured to a permanent support, and a bar connecting with the clutch engaging and disengaging mechanism, having one end pivoted to said arm and the other end fitted in an opening at the opposite side of the frame to allow a longitudinal movement thereto, whereby a movement of the car forward as it passes against the cord 12 will disengage the coupling from the winding-drum, as described.

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