(No Model.)

J. M. DUNCAN.

SALT HOPPER.

No. 322,360. Patented July 14, 1885.

Fig. 1.

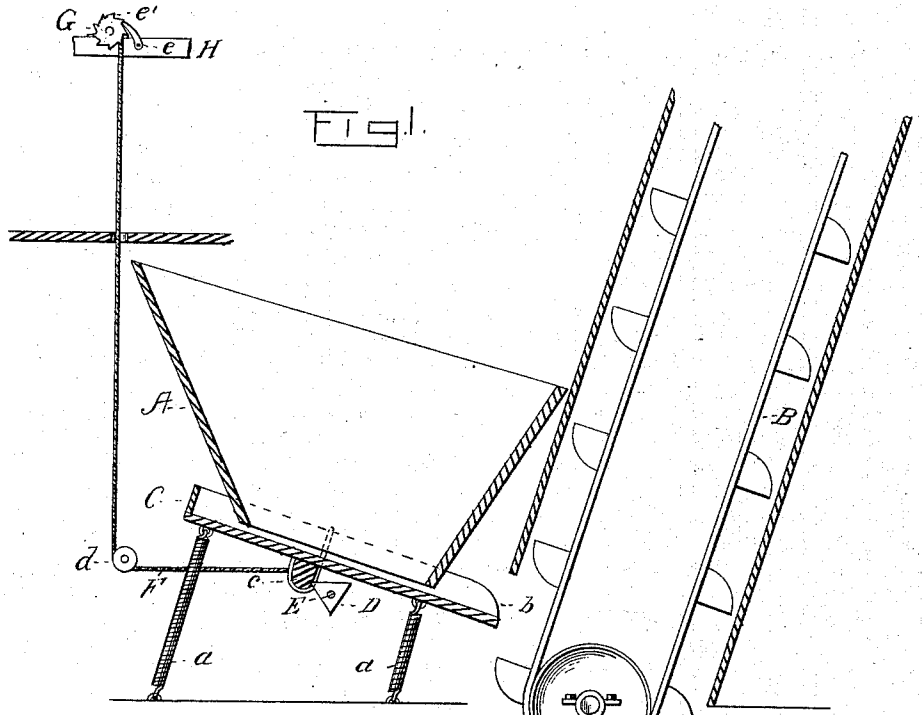


Fig. 2.

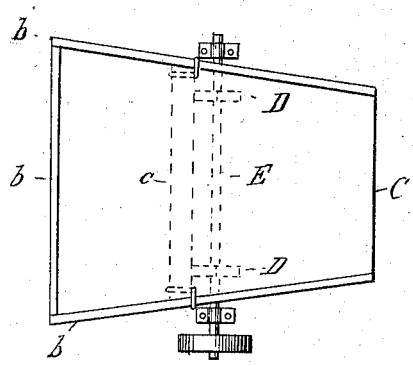
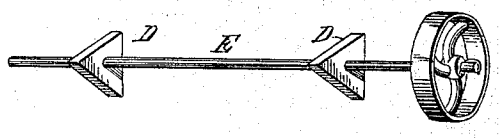


Fig. 3.



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UNITED STATES PATENT OFFICE.

JOSEPH M. DUNCAN, OF WARSAW, NEW YORK, ASSIGNOR TO HIMSELF AND EBEN O. McNAIR, OF SAME PLACE.

SALT-HOPPER.

SPECIFICATION forming part of Letters Patent No. 322,360, dated July 14, 1885.

Application filed March 16, 1885. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH M. DUNCAN, of Warsaw, in the county of Wyoming and State of New York, have invented a new and useful Improvement in Salt-Hoppers; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

In the manufacture of salt much annoyance, together with great expense and loss of time, results from the fact that the salt, unlike grain, will not feed regularly, even if placed in a hopper having very steep sides, as it bridges over and hangs together in such a mass as to require constant agitation to feed it regularly into the elevator-buckets, and this fact has heretofore necessitated the constant attendance of one person at each hopper, at considerable expense where many hoppers were used. It is therefore my object to do away with the expense attending the presence of a man at each hopper, and at the same time provide means for feeding the salt continuously and regularly into the elevator; and the novelty of my invention consists in the combined construction and arrangement of a shoe in the bottom of the hopper and means for supporting said shoe, together with a series of knockers, and means for regulating the blow of said knockers, all as more fully hereinafter described and claimed.

For a better understanding of my improvements, reference should be had to the accompanying drawings, in which—

Figure 1 is a side elevation of a chain of elevator-buckets, combined with a salt-hopper embracing my improvements, partly in section; Fig. 2, a detail plan view of the shoe used in the bottom of the hopper, and Fig. 3 a detail of the knockers and their shaft.

Like letters of reference indicate corresponding parts.

A denotes the hopper, made with inwardly-sloping sides of any size required; and B, a chain of elevator-buckets, combined with the hopper in the usual way, at that end of the hopper where the salt is delivered. This hopper has a bottom consisting of a shoe, C, of any desired shape, arranged independently of the hopper on an incline, which may be varied to any angle desired. This shoe is supported at opposite points by springs *a a*, either spiral or of some other preferred style, and has sides *b b b* vertically extended upwardly, except at the end where the salt is fed into the elevator-buckets. These extended sides *b b b* form an inclosure around the outside of the lower portion of the hopper and prevent the escape of salt at any point except at the end where it passes out into the elevator-buckets.

D D are two or more triangular or other angular-shaped knockers, secured to a shaft, E, arranged transversely under the bottom of the shoe C, with any proper end bearings, and with belt or gear connection with the driving-power. One or more irons, *c*, are secured transversely to the bottom of the shoe C, within convenient reach of the knockers, against which the iron or irons of the shoe are pressed by the springs *a a*, acting in conjunction with the preponderance of weight of the salt, and on the revolution of the shaft E these knockers strike this iron or irons and cause the shoe to vibrate and feed the salt continuously and regularly from the hopper into the elevator-buckets. To the bottom of the shoe, at any convenient point, is attached one end of a rope or strap, F, which passes around a pulley, *d*, located outside of the hopper, and then up to a shaft, G, where its upper end is securely fastened. This shaft has bearings in a beam, H, and is provided with a hand-crank and a pawl and ratchet, *e e'*, respectively. By turning the crank of this shaft the shoe may be either drawn back or allowed to move forward to regulate the blow of the knockers, and thereby in turn regulate the feed of the salt.

Instead of arranging the crank with its pawl and ratchet above, as herein described, these parts may be arranged parallel to the knocker-shaft, in which instance the pulley could be dispensed with.

It will be apparent that where a series of hoppers are arranged in a row one knocker-shaft and one set of feed-regulating devices, together with one set of gearing, will suffice for the whole series.

Among the advantages asserted for my improvements are, that they are simple and ef-

fective, and can be applied to a single hopper or to a series of hoppers at a very small expense compared with that attending the hire of a man for each hopper.

Having thus described my invention and set forth its objects, together with some of its advantages, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with a hopper, of an elastically-supported bottom, a set of angular knocking devices, and a pawl-and-ratchet mechanism having intermediate connections with said bottom for regulating the blow of the knockers, substantially as described.

2. The hopper A, having the inclined independent shoe or bottom C, and the springs *a a*, secured to the floor or other support, and to the under side of said shoe or bottom at its front and rear ends, substantially as described and shown.

3. The hopper A, having the inclined independent shoe or bottom C, with vertically-extended sides *b* and iron *c*, the bottom-supporting springs *a a*, the angular knockers D, and their shaft E, all combined substantially as described and shown.

4. The combination, with the hopper A, of the inclined independent shoe or bottom C, supported upon springs *a a*, the shaft E and its angular knockers D, and pawl-and-ratchet mechanism having intermediate connections with the shoe or bottom C, substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH M. DUNCAN.

Witnesses:
E. O. McNAIR,
WM. H. McCONNELL.