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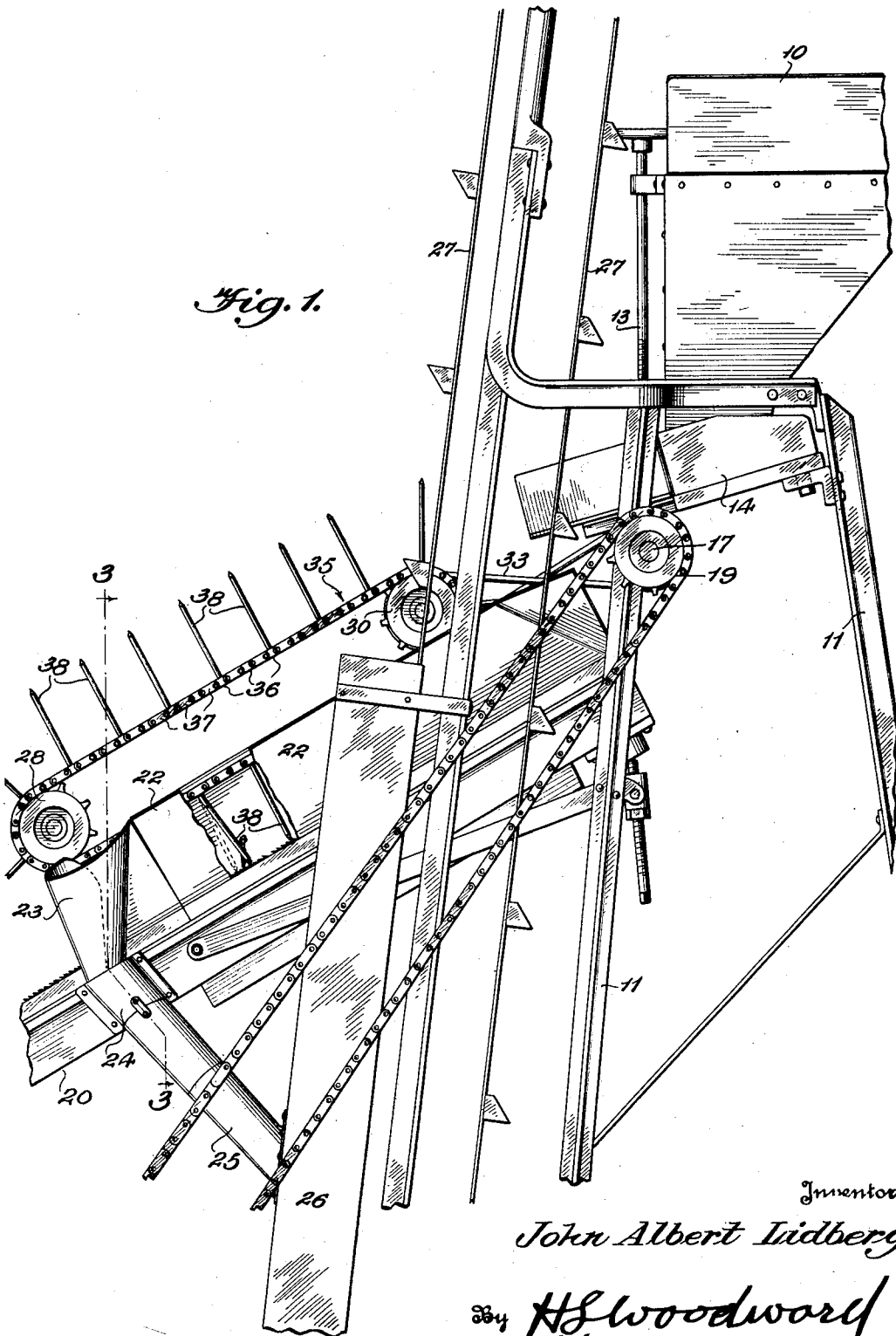
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CHUTE RAKE AND ORDERING DEVICE

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3 Sheets-Sheet 1

Fig. 1.



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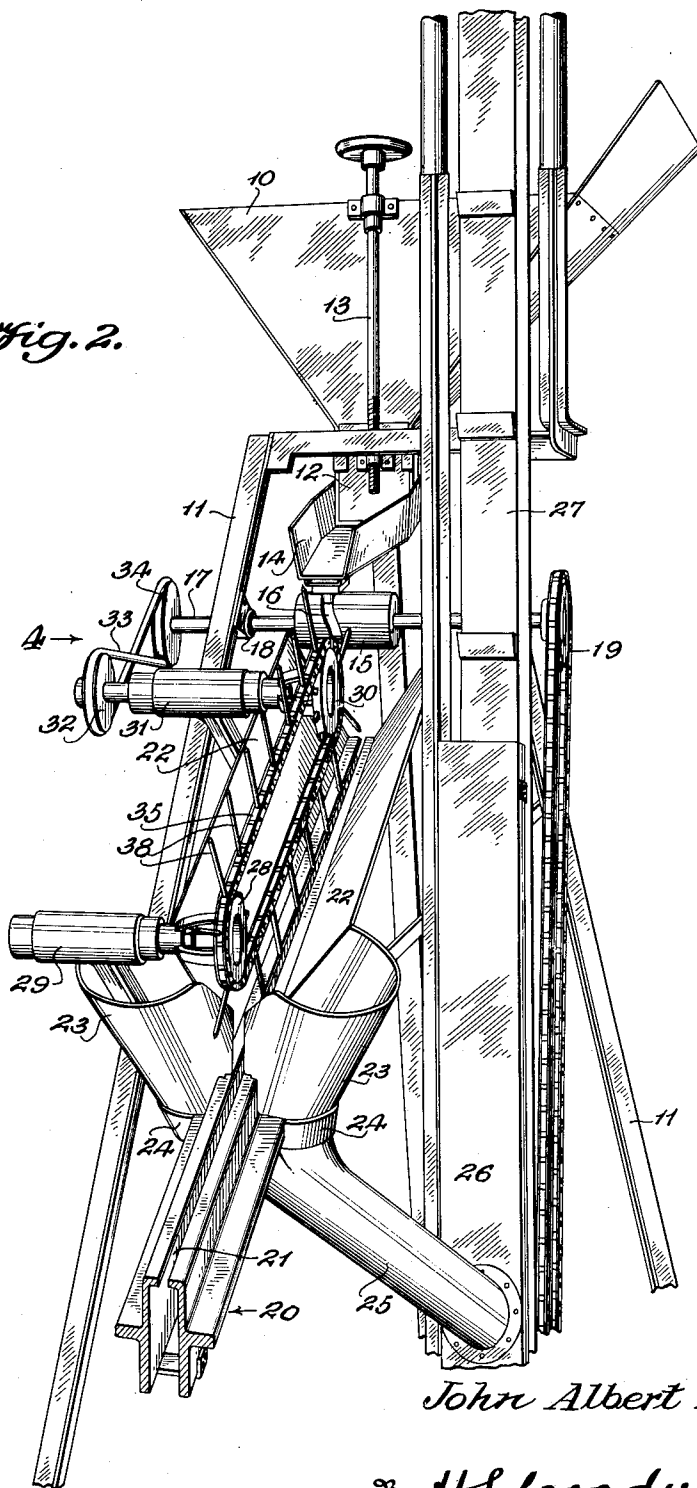
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Fig. 2.



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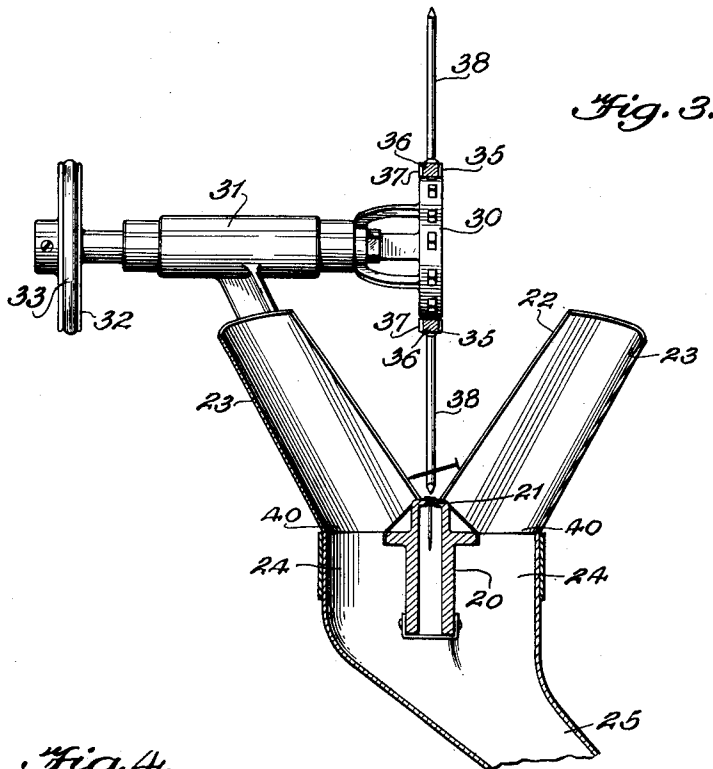
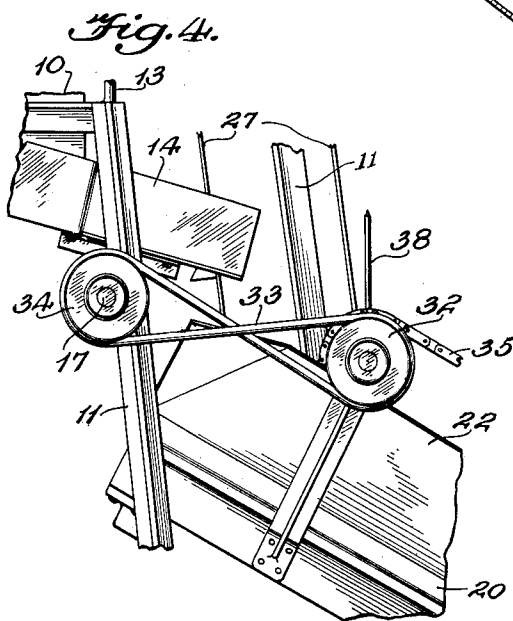
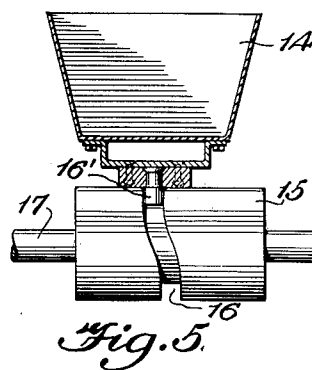
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UNITED STATES PATENT OFFICE

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CHUTE RAKE AND ORDERING DEVICE

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setts

Application May 14, 1931. Serial No. 537,464

5 Claims. (Cl. 10—165)

The invention has for an object to present an improvement in feeding mechanisms suitable for use in packaging machines, or in machines for working on headed articles particularly, and generally applicable and adapted to use in handling various articles to receive them in bulk, and deliver them in uniform position to counting machines, or machines by which work is to be done on the articles.

It is an object to provide a novel organization of feed hopper, chute, article ordering device and return of surplus stock attaining highly improved effect with the use of simple apparatus, to the end of improving the functions of such machines and enabling supply of ordered stock for more rapid operation or for large counts in charge forming and delivering mechanisms of package filling machines or other machines without material alteration of the original machines.

A special purpose of the invention is to construct a novel nail ordering means and particularly a novel rake for such mechanisms adapted to function peculiarly as compared to prior functions of elements for such purposes. It is a further particular aim to present a novel means for collecting and returning surplus stock from the ordering device.

Other peculiarities of invention, and additional advantages may be understood from the following description and accompanying drawings forming part of this application, wherein

Figure 1 is a side elevation of a machine embodying my invention,

Figure 2 is a view from the front of the machine with all parts broken away in front of the nail ordering chute and rake.

Figure 3 is a fragmentary detail of the rake structure.

Figure 4 is a detail of the operative connection.

Figure 5 is a fragmentary cross section through the support for the swinging end of the oscillating trough.

There is illustrated a stationary hopper 10 elevated upon a tripod 11 in the present instance, and adapted to carry a large bulk of stock. It is arranged to deliver stock through a closure or gate 12 (operated by hand screw 13) to a laterally oscillating trough 14 below the gate, being pivoted immediately to the rear of the throat of the hopper on the tripod, and projecting some distance in front of the discharge opening of the hopper, being inclined downwardly from its pivot to its forward extremity. This trough is oscillated by means of a cam roll 15 which supports the forward portion of the hopper and has a serpentine groove 16 therein receiving a pin 16' on the bottom of the trough. The shaft 17 of the cam is journaled in bearings 18 on the front legs of the tripod 11, and is driven by a chain and sprocket at 19.

An inclined ordering or starting chute 20 is mounted with its upper end adjacent and below, the lower end of the oscillating trough, this chute consisting of two parallel rails spaced to form a slot 21 of a width to receive loosely the shanks of the articles to be ordered therein and to engage and support the heads or other enlargement or transverse portions of the articles which may rest upon the tops of the rails. Above and parallel to this chute there extend two outwardly inclined plates 22 forming in effect a V-shaped trough of which the chute 20 forms the bottom, and at the lower end of this chute trough there is outwardly and backwardly inclined a lateral bowed plate 23 on each side, forming a continuation of the respective plate 22 and extending inward and then rearward at the forward part toward and partly over the chute 20 so that the opposed plates 23 considered together are much in the form of a funnel with its upper part inclined toward the upper end of the chute 20. The lower opposed front edges stop short in parallel relation at the sides of the slot 21 and are divergent forwardly so as to fend laterally articles thrown thereagainst from the upper part of the chute. The plates, however, unlike the plates 22 do not have the space therebetween closed at the bottom by the chute 20, but are bowed outward and provided with spouts 24, leading downwardly beside the chute into a return pipe 25 which extends downwardly into a conveyor box 26, an endless belt-bucket conveyor 27 operating in the box. The conveyor is mounted and operated so as to deliver articles from the box 26 to the hopper 10, and may be of any usual construction.

The box 26 is in the form of a sleeve through which the conveyor buckets move, engaging and carrying up the nails returned from the chute 20.

The chute 20 is continued at its lower part a considerable distance beyond the funnel plates 23 where it is utilized in conjunction with a counting and ejecting mechanism not shown, to deliver the stock from the chute in measured charges.

Immediately over the spouts 24 a sprocket 28 is mounted on a shaft journaled in a bracket 29 at the left hand side of the trough 22 and funnel plate 23. Near the head of the chute a similar sprocket 30 is mounted on a similar bracket 31, the shaft from this sprocket however being projected from the left of the bracket and having a pulley 32 thereon driven by a crossed belt 33 from a pulley 34 on the shaft 17.

On the sprockets 28 and 30 there is engaged an endless chain 35 having alternate block links 36, and side links 37 connecting the block links. Some of the block links are drilled to receive snugly with a driving fit large wire nails or similar tines 38, of considerable thickness and size,

nails being commonly used therefor because of convenience in obtaining ready formed elements. These tines may be otherwise formed and may be welded or otherwise secured to the chain.

5 For a machine packaging six to eight penny nails, the tines have been formed of twenty penny nails. The heads of the nails may be removed and the nails driven through the chain links 36 until the ridges on the nail shanks next the head become tightly engaged in the chain links. The extreme heavy weight of these tines compared to bristles of mere brush sweeps is a material factor of great and peculiar utility.

10 The sprockets 28 and 30 are so spaced above the chute 20 and the chain so adjusted that as it moves in its orbit the tips of the tines 38 lightly strike the heads of the nails properly suspended in the slot 21, but will strike more directly and forcibly any nails which may lie upon or above the heads of these properly engaged in the slot 21.

15 The effect of this is to deliver light hammer taps to the nails in the slot, causing them to loosen if jammed or hooked, adjust themselves uniformly in the chute, and move readily downward therein; and in clearing disordered nails lying above those suspended through the slot 21. The tines have sufficient inertia to jostle out of place nail stock or other articles which may become hooked on heads of those properly engaged in the slot 21. The funnel plates 23 are spaced apart sufficiently to afford a slot between which the tines 38 may freely pass. And preferably the plates 23 have their edges next the chute inclined so that they converge toward the upper part of the chute. The lower part of each plate 23 is sufficiently large, and is bent, to form a throat 40 at the entrance to the respective spout 24 large enough to receive readily articles which are swept down the trough of the chute 20.

20 The chain 35 has little slack in it, but is loose enough to permit the tines to be deflected when encountering stock which resists excessively direct movement by the rake device. That is to say, they are swingingly mounted, but tend to remain in a vertical plane with the slot 21. The speed of the chain 35 is preferably much more than that of the stock sliding along the chute 20 under action of gravity after it leaves the oscillating trough 14, the result being to remove rapidly articles which have fallen upon the chute 20, so that a substantial clear chute portion is afforded for the following stock, which is thereby enabled to roll or drop into the chute slot 21 readily. The tines are so spaced and of such length that their extremities while passing around the sprocket 28 are spaced apart much more than the length of the articles being packaged, thus leaving an ample clearance in the slot 21 as the stock drops from the oscillating trough 14. The lower edges of the trough plates 22 are spaced from the slot 21 sufficiently to clear the heads of nails properly engaged in the slot but preferably not further.

25 In operation, stock, nails for instance, being introduced into the hopper 10, and the gate 12 adjusted to permit the stock to feed therefrom as removed by the oscillating trough 14, the nails fall into the trough-like space between the plates 22 and quickly roll and slide into the lower part of the space with their longitudinal axes parallel to the slot 21, into which their shanks quickly fall as the tines 38 sweep along the chute 20. The tines jostle such nails when a number are side

by side, so that one of them falls into the slot, followed by others. Any nails which are moved through the trough plates 22 and over the nails closely arranged in the slot 21, are swept all the way to the funnel plates 23 and returned to the hopper 10 by the return chute 25, box 26 and conveyor 27. The chain driving the sprocket at 19 causes the serpentine grooved roll 15 to move the lower end of the trough 14 from side to side rapidly, dropping the nails onto the chute 20, and the endless chain rake then operates upon the nails over the chute slot 21, as explained.

30 It should be noted that the mutually adjacent front edges of the plates 23 are trimmed with a curve at the upper part extending forwardly from intermediately of their height. These curved edges extend upwardly, forwardly and divergently, forming a V-shaped space. By this arrangement, if any of the tines 38 should be too far to one side so as to initially pass outwardly of the rearwardly directed edge portion of either plate 23, the tine will be gradually swung rearwardly by the plate until it presses downward on the inclined edge with sufficient force to cause it to slide inward and downward thereon and pass between the plates 23.

I claim:

1. A machine of the character described comprising a stock receiving slotted chute, inclined plates therebeside forming a trough-like space over the chute, and opposed funnel sections forming terminations of the respective first named plates, means to deliver articles upon the chute at one end, means to rake them along the chute and to rake excess articles into the funnel sections, said last named means comprising an endless carrier having a part movable longitudinally over the chute and heavy tines thereon projected toward the chute and tending to lie in the medial plane thereof but mounted yieldingly to swing back and forth and laterally, whereby they may function with a hammer-like action upon articles in the chute and said trough-like space.

2. The structure of claim 1 in which said funnel sections have opposed front edge portions next the chute divergent forwardly but spaced to permit passage of said tines, said chute extending forwardly beyond the funnel sections a substantial distance.

3. The structure of claim 1 in which said funnel sections have their upper parts extended a substantial distance above the line of the chute and inclined backwardly toward the receiving end of the chute whereby to catch articles thrown forwardly above the chute.

4. A rake device for an ordering chute of the character described, comprising an endless orbitally movable flexible member and a multiplicity of extremely heavy swingingly mounted tines carried thereby of considerable length and having great inertia in relation to the articles to be ordered, and means to move the endless member along the chute at a speed much exceeding that of the stock in the chute.

5. The structure of claim 1 in which the said funnel sections have opposed spaced apart front edge portions divergent forwardly, and have the opposed upper edges curved divergently upward, forwardly and outwardly from intermediately of their height to form a V-shaped space, whereby the tines striking laterally outwardly of said slot will engage said edge and be warded toward a central position to pass through the slot.