

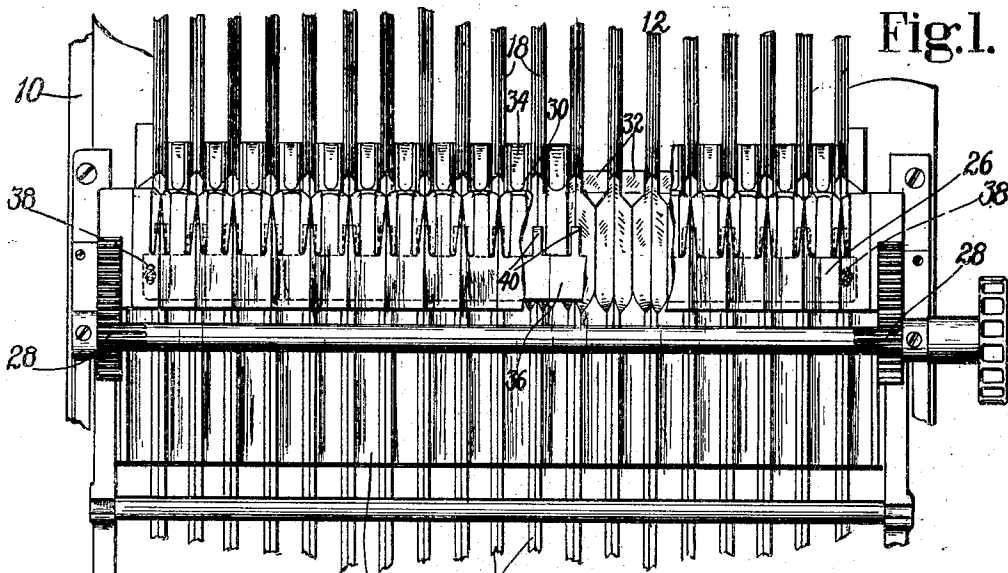
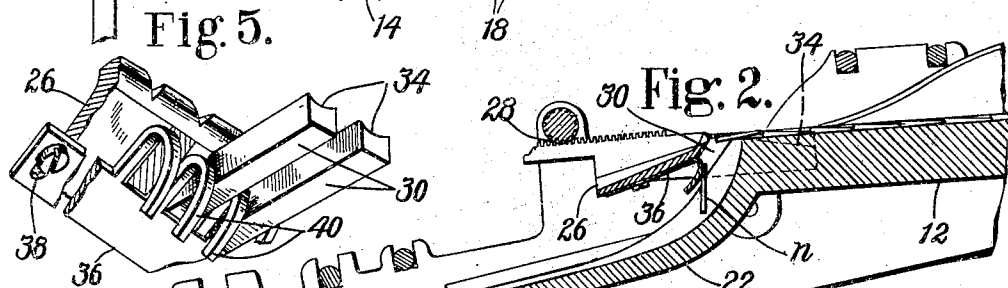
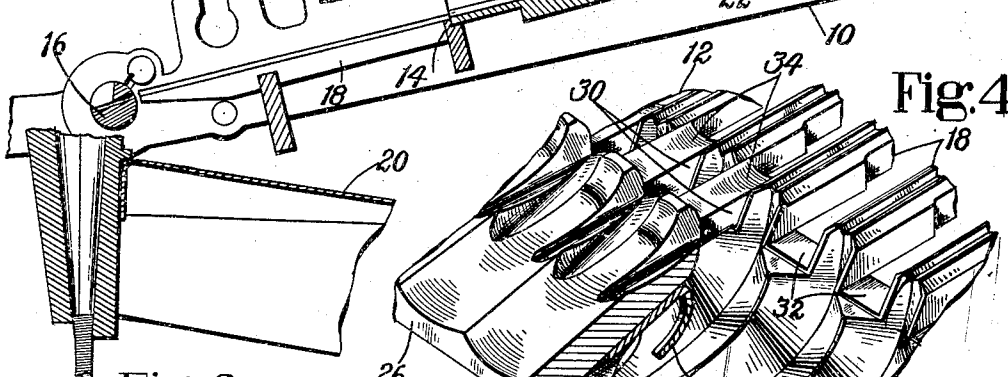
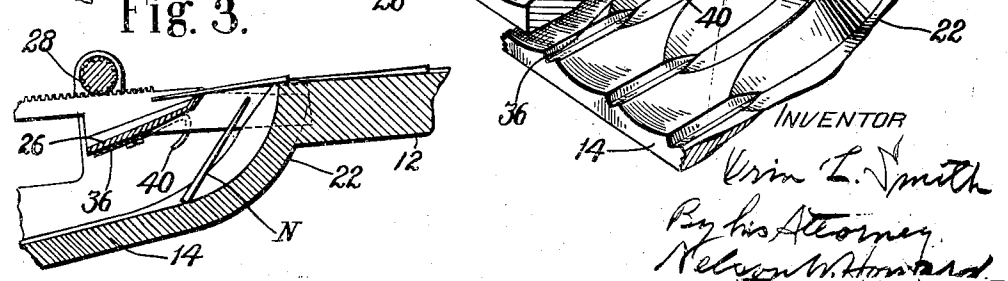
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O. L. SMITH

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NAIL DISTRIBUTOR

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UNITED STATES PATENT OFFICE

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NAIL DISTRIBUTOR

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This invention relates to mechanisms by which nails or like fastenings are taken from a mass and distributed in loads, each including a predetermined number, for delivery to a machine, as a heel-attacher, at which they are utilized.

In these distributors it is desired that the nails shall be delivered with their ends in a definite relation, with the points up or down, depending upon the direction in which they are to be driven. To obtain this orderly arrangement, the plan disclosed in Letters Patent of the United States No. 1,005,303, Pope, October 10, 1911, is frequently employed. In this mechanism, sections of an inclined nailway are arranged at different heights, having alined nail-conveying channels, which are connected by curved portions rising from the lower section to the upper. Above this curved connecting section and opposite the ends of the upper channels is located a nail-reversing device, commonly termed a balancing bar. If the nails are discharged from the upper channels with their heads foremost, the weight of these so influences the courses of the nails that they do not reach the bar, but move without reversal through the intermediate channels into the lower nailway-section. On the other hand, if the nails leave the upper section points first, these lighter portions cross the space to the balancing bar, and then, upon heads leaving the upper section, these are directed forwardly by the curved channels as they fall from the bar. As a consequence of this, all the nails descend the lower section heads first.

These distributors must operate satisfactorily upon nails differing greatly in length, the balancing bar being adjustable toward and from the upper nailway-section, so it may be caused to catch the point of any nail of a range of sizes from the minimum to the maximum before it overbalances. Because it has been found that there is a tendency for long nails to fall sideways across the curved connecting channels beneath the balancing bar, clogging these, it has been customary to somewhat increase the height of the channel-walls at this point to furnish lateral support. But since short nails tend to overlap in these

intermediate channels and also clog, the walls are made more divergent, so the channels are wider at the tops, and the short nails travel more freely through them. This, however, aggravates the lateral displacement of the long nails, and it has been difficult to arrive at a relation which will be effective for all lengths. It is an object of my invention to overcome this trouble and hold the long nails upright laterally, while leaving a properly free passage for the short nails. To this end, I space vertically from the lower section of the nailway, members extending over the upper sections and arranged to maintain against lateral displacement nails delivered by the upper section and direct them beneath the balancing bar. By thus spacing the directing members, the connecting channels are left free to be formed in any transverse contour which best disposes of the short nails. Preferably, the directing members, which extend between the channels, are in the form of partitions projecting from the balancing bar or other reversing device, and since this bar is variable in position for the reason previously given, these projections have an excess of length, which lies over the upper section, being shown as received in depressions therein. Thus the partitions, by their contact with the descending nails at either side, are, for all adjustments of the bar, effective to prevent their tipping laterally until they are received and restrained against movement in this direction by the walls of the intermediate and lower channels. As the upper edges of the directing partitions may act to catch and retain nails, with possible clogging, these edges are preferably inclined rearwardly, and may have conveying channels. Thus nails lodging upon the partitions are conducted back between the bars of the upper nailway-section for return to the source of supply.

Irregular action of this type of distributor may also result from the fact that short nails, which are discharged heads first from the upper section into the passage beneath the reversing device or balancing bar, and so are not subjected to the reversing action of said bar, are sometimes projected with such ve-

locity that they do not slide down the curved intermediate channels, but pass nearly or quite over these, and, after striking at the bottom, turn forwardly, their points advancing so they are reversed from the desired direction. It is also true that short nails, which have been acted upon by the balancing bar, may tip in the wrong direction after they have fallen, heads down, from said bar. A further object of my invention is to prevent this reversal and insure the delivery of all the nails in their correct relation to the channels of the lower railways. In the accomplishment of this object, I vary a transverse dimension of the passage through which nails are traveling, providing a member arranged to contact with the upper sides of the nails discharged from the upper section, and to deflect them down upon the lower section. In this way, the velocity of the nails is reduced, or their upper extremities are held back, and they fall into the intermediate channels in the longitudinal relation in which they are delivered. As herein illustrated, the passage-varying contact member is situated below the reversing device, being, more specifically, supported upon it, and may be in the form of depending fingers corresponding to the railway-grooves. Space is thus given between the fingers to receive the directing partitions for the long nails, if these features be used together. The contact member may be fixed at different distances from the upper railway-section to give its best deflecting effect, as by an adjustment of the balancing bar or by an independent variation in the position of the member upon said bar.

In the accompanying drawing, in which is disclosed one of the several embodiments which the present invention may assume,

Fig. 1 is a top plan view of a portion of a nail-distributor at the balancing bar, with which are associated the elements of this invention;

Fig. 2 is a somewhat enlarged and extended vertical longitudinal section through the mechanism, particularly illustrating the action upon short nails;

Fig. 3 is a similar view at the balancing bar, showing the effect upon long nails;

Fig. 4 is a perspective view of a portion of the more essential elements of the invention; and

Fig. 5 is a like view of the under side of the balancing bar.

At 10 appears the frame of a nail-distributor carrying a raceway or railway, consisting of an upper section 12 and a lower section 14, both inclined to facilitate the advance of nails to a discharge-roll 16 along longitudinally alined channels in the raceway. These channels may be furnished by grooves formed, in part, in the upper edges of bars 18 spaced from one another to permit nails displaced from the grooves to fall upon

a chute 20 and be returned thereby to the nail-drum or other source. Joining the upper and lower sections is an intermediate section 22, in which the conveying grooves are curved downwardly to best direct the nails in their passage between the main sections. To cause the travel of the nails over the raceway, the frame 10 is oscillated by connections to a power-shaft (not illustrated).

Since it is desired that the nails shall all arrive at the discharge-roll uniformly arranged as to the direction of their heads and points, a reversing device is furnished, as by a balancing bar 26 arranged over the raceway-section 22 at the juncture of the upper and lower main sections, as in the patent previously mentioned. This bar may be adjusted toward and from the upper section by rack-and-pinion mechanism 28 to leave such a space between the ends of the grooves in said section and the adjacent edge of the bar that nails proceeding heads first will overbalance and slide down the intermediate grooves without contact with the bar, while those having the lighter points first will bridge the space to the bar. When the heads of these last-mentioned nails leave the upper section, they will tip back upon the curved grooves and be reversed, so that upon the lower section all nails will have their heads in advance.

The grooves in section 22 are so formed that the short nails, sometimes advancing so rapidly that they tend to overlap as they fall from the upper section and from the balancing bar, will have a chance to free themselves, and clogging will be avoided. This is best attained by making these grooves of substantial width, and of not excessive depth, they being V-shaped in transverse section, with their sides diverging at a considerable angle. These grooves, however, acting efficiently upon short nails, may be less satisfactory for long nails. As the latter descend into the section 22, striking upon the heads in a nearly upright position, they may tip laterally of the raceway, and, as the walls between the grooves of this intermediate section are not sufficiently high nor close enough to the vertical to restrain them, they may fall across the walls. Here, twisting at various angles and contacting with one another, they may clog. To prevent this without in any way affecting the feed of short nails, I interpose between each pair of adjacent grooves of the section 22 directing members in the form of partitions 30. These partitions may be of such vertical dimensions that they will retain against lateral tipping all nails not properly held by the groove-walls, as is best shown in connection with the nail N in Fig. 3, and have their lower edges sufficiently spaced from the bottoms of the grooves in the section 22 to avoid interference with short nails. Longitudinally of the raceway they are best of such length that they will

completely bridge the space between the balancing bar and the section 12. Because the bar is variable in position, I prefer to mount the partitions upon said bar, they being conveniently cast as projections integral with it. These projections are shown as extending into depressions 32 furnished between the bars 18 of the upper section, their length being such that they remain in the depressions for all adjustments of the bar, thus insuring the continuity of the division between the upper portions of the grooves in the section 22.

It has been found that the upper edges of the partitions 30 give surfaces upon which nails may lodge, become crossed and clog. To prevent this, these edges are downwardly inclined at 34 oppositely to the raceway-grooves, and are themselves grooved. Consequently, when nails become displaced from the grooves in the section 12 upon these partitions, the rearward inclination and the oscillation of the mechanism cause the nails to be carried back between the raceway-bars, wasting upon the chute 20 for return to the source and delivery therefrom.

When short nails are thrown heads first from the upper raceway-section, they do not engage the balancing bar for reversal, but are projected beneath the bar to the lower portion of the section 22, there entering the conduit or passage formed between the under wall of said bar and the railway. Sometimes their velocity under these conditions is sufficient to cause them to somersault upon their heads and to strike points first, or in the direction opposite to what is desired. To guard against this action, and also a similar reversal of short nails which, in falling heads down from the balancing bar, tilt forwardly instead of in the desired longitudinal relation, with the heads in advance, I place in the path of the short nails, so delivered as to be thus reversed, a deflecting member, which is preferably attached to the balancing bar. This member has a body-portion 36, shown as secured to the under side of the bar by slot-and-screw connections 38, by means of which the deflecting member may be adjusted toward and from the ends of the grooves in the raceway-section 12 independently of the position of the balancing bar under the influence of its controlling mechanism 28. Extending from the body-portion are downwardly and forwardly curved fingers 40 substantially filling the space between the partitions 30, and alined, respectively, with grooves in the section 12. Because of their form and their relation to the ends of the grooves in the upper section, short nails *n*, which would be overturned as just described, will strike the fingers, as is illustrated in Fig. 2, with the result that the points are held back and the momentum reduced, so that when they fall upon the raceway, they will assume their normal positions, with the

points to the rear. Nails traveling at a less velocity, or falling from the balancing bar, will not come under the influence of the deflecting member. If a short nail, proceeding point first and therefore acted upon by the balancing bar, tends to tip forward when its head strikes the raceway-section 22, its point contacts with the deflecting member and is held back. Therefore, all the nails pass upon the lower section with the heads in advance. When the bar is moved away from the upper raceway-section to adapt it for co-operation with long nails, the deflecting member is so carried away from the section 22 that it has no effect upon such nails.

With the organization of this invention, it will be seen that in delivering nails between the upper and lower raceway-sections, all lengths may be operated upon without liability of clogging, and with the maintenance of the desired uniform relation of the heads and points.

Having described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a nail-distributor, a railway having upper and lower sections in which are nail-conveying channels, and members spaced vertically from the lower section and extending over the upper section, said members being arranged to maintain against lateral displacement nails delivered by said upper section.
2. In a nail-distributor, a nail-way having upper and lower sections in which are nail-conveying channels, and nail-directing members extending over the lower section and between the channels of the upper section.
3. In a nail-distributor, a railway having adjacent sections in which are nail-conveying channels, a movable member situated above one of the sections, and partitions extending from the member over the other section and co-operating with the channels thereof.
4. In a nail-distributor, a raceway having adjacent grooved sections, and a nail-reversing device situated near the juncture of the sections and carrying partitions having grooves upon their upper edges and extending between the raceway-grooves.
5. In a nail-distributor, a raceway having upper and lower grooved sections, and a balancing bar arranged for engagement by nails delivered by the upper section and provided with projections extending over said upper section.
6. In a nail-distributor, a raceway having upper and lower grooved sections, there being depressions between the grooves of the upper section, and a balancing bar movable toward and from the upper section and arranged for engagement by nails delivered thereby, said bar having projections extending into the raceway-depressions.
7. In a nail-distributor, a railway having

upper and lower sections in which are nail-conveying channels, and partitions situated between said channels at the juncture of the sections and provided with nail-conveying channels.

8. In a nail-distributor, a railway having upper and lower sections in which are nail-conveying channels, and partitions situated between said channels at the juncture of the sections, the upper edges of the partitions being inclined rearwardly and provided with grooves.

9. In a nail-distributor, a railway having upper and lower sections including spaced bars having nail-conveying grooves, and partitions situated between the grooves at the juncture of the sections, the upper edges of the partitions being inclined rearwardly and provided with grooves delivering between the bars of the upper sections.

10. In a nail-distributor, a railway having upper and lower sections, there being a passage through which nails travel between the sections, and a member arranged to vary a transverse dimension of the passage.

11. In a nail-distributor, a railway having upper and lower sections connected by a passage, a member adjustable in the passage and arranged to contact with the upper sides of nails discharged from the upper section and to deflect them downwardly upon the lower section, and means arranged to fix the contact member at different distances from the upper section.

12. In a nail-distributor, a raceway having upper and lower sections, a nail-reversing device situated near the juncture of the sections, and a nail-deflecting member situated below the reversing device and adjustable independently of the reversing device.

13. In a nail-distributor, a raceway having upper and lower sections, a nail-reversing device situated near the juncture of the sections and movable with relation thereto, a nail-deflecting member having beneath the reversing device a nail-deflecting surface inclined downwardly and in the direction of advance of the nails over the lower section, and means arranged to move the deflecting member independently of the reversing device.

14. In a nail-distributor, a grooved raceway having upper and lower sections, and a balancing bar located near the end of the upper section and provided with fingers situated in the paths of the nails discharged from the grooves of said section.

15. In a nail-distributor, a raceway having upper and lower sections, a balancing bar movable toward and from the end of the upper section, and a nail-deflecting member movable upon the balancing bar.

16. In a nail-distributor, a grooved raceway having upper and lower sections, and a balancing bar located near the end of the

upper section and provided with nail-directing partitions situated between the raceway grooves and with nail-deflecting fingers opposite said grooves.

17. In nail-distributor, a raceway having upper and lower grooved sections, there being depressions between the grooves of the upper section, and a balancing bar movable toward and from the upper section and arranged for engagement by nails delivered thereby, said bar having nail-directing partitions extending into the raceway-depressions and nail-deflecting fingers depending from the bar opposite the grooves of the upper section.

In testimony whereof I have signed my name to this specification.

ORIN L. SMITH.