

Dec. 10, 1957

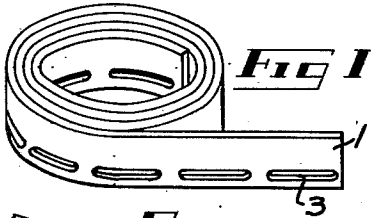
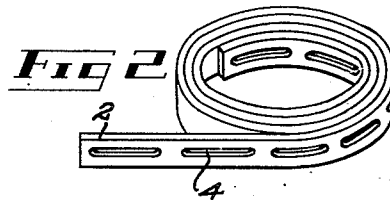
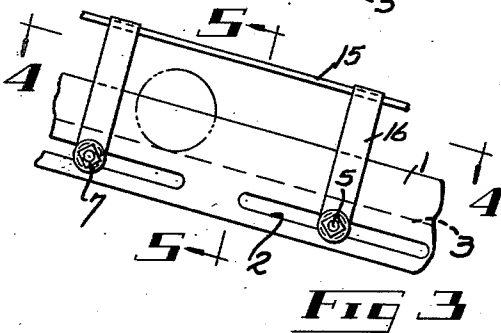
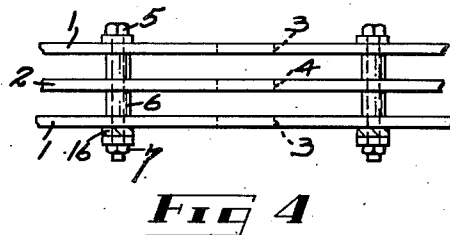
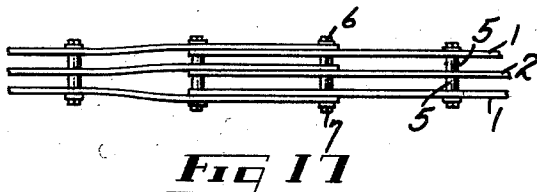
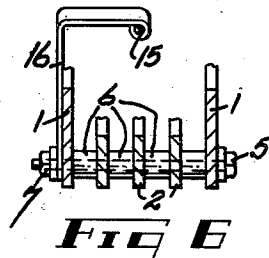
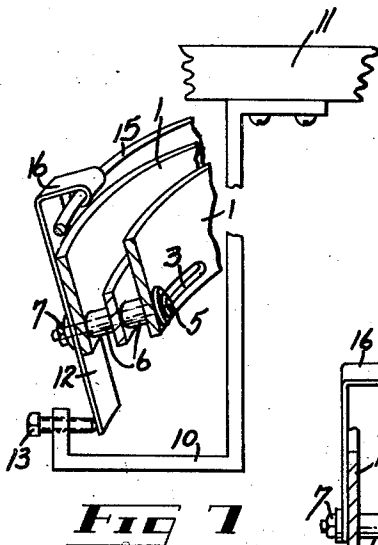
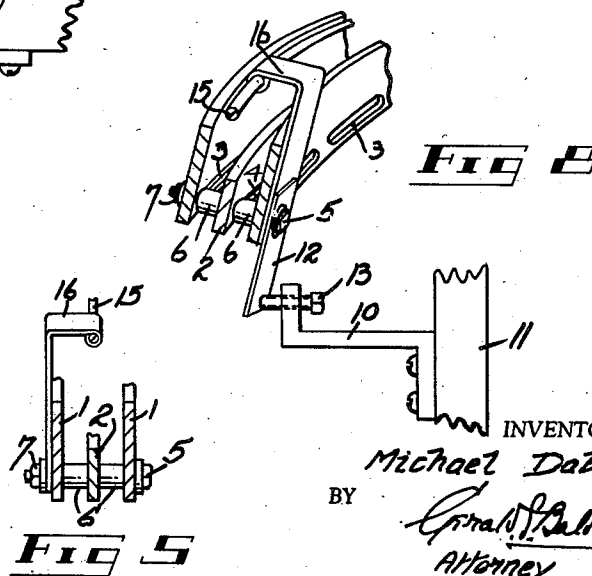
M. DABICH

2,815,841

CHUTING

Filed Dec. 12, 1956

2 Sheets-Sheet 1



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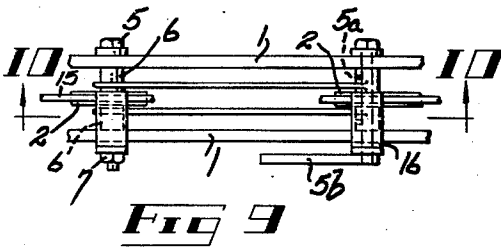
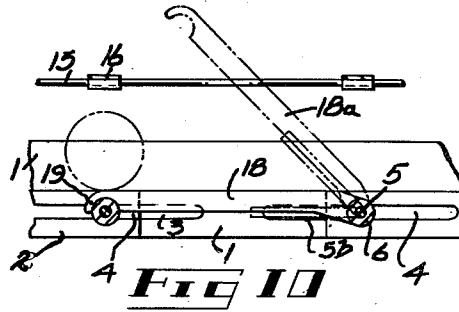
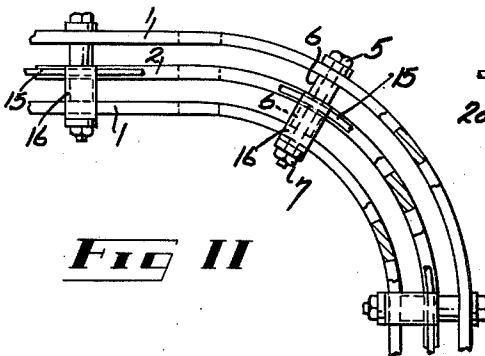
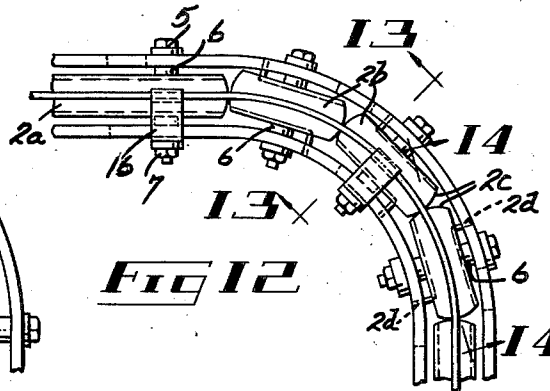
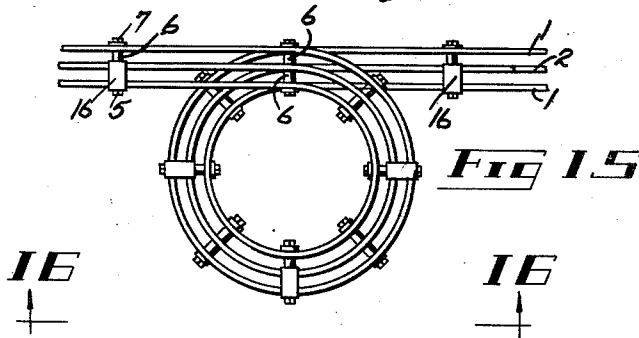
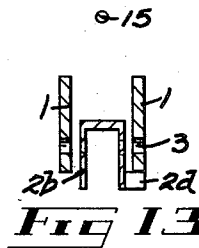
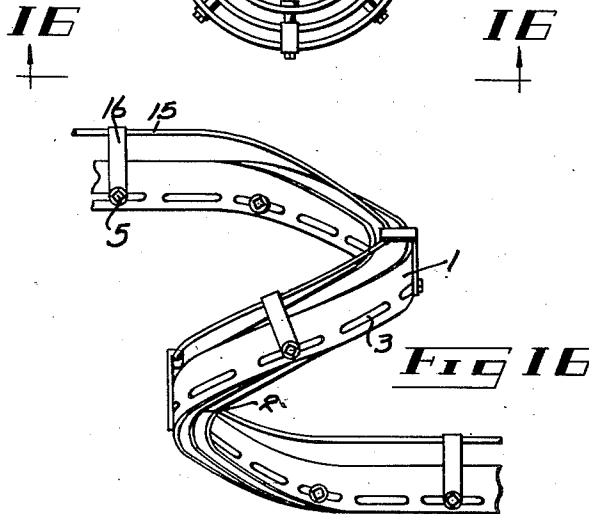
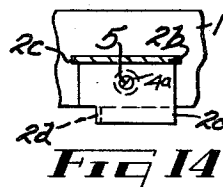
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2,815,841

CHUTING

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2 Sheets-Sheet 2



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2,815,841

CHUTING

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11 Claims. (Cl. 193—25)

This invention relates to improvements in chuting. At the present time chuting of the required length shaped to extend between a dispatching and a receiving station, for the flow of articles by gravity from the former to the latter, is usually fabricated prior to shipment to the location where it is to be installed, and consequently considerable engineering and drafting expense is involved in its manufacture.

It is an object of the invention to provide chuting including both side and carrier rails, so prefabricated that they may be shipped to the location where installation is to be made in long lengths or coils from which portions of required length are cut and secured to one another in spaced relation by suitable fastening means. In order to render this possible the side and carrier rails are each provided with elongated, longitudinally aligned openings therethrough and the distance between adjacent extremities of each pair of openings is materially less than their length, so that though the openings through the different rails may be transversely misaligned fastening means may be inserted transversely through all the rails at intervals to hold them in spaced relation.

Another object of the invention is to provide such chuting wherein both the side and carrier rails may be made of flexible material so that they may all be flexed laterally about a common axis and held securely spaced from one another at any desired curvature through any angular distance by the fastening means, although around such curves each rail is necessarily a different length. Or if the carrier rail is laterally inflexible it may consist of short, separate longitudinal portions held spaced between the curved portions of the side rails by the fastening means.

The invention also aims, among other things, to provide chuting: wherein a longitudinal gap is formed in the carrier rail intermediately of its length across which an escape gate normally extends and over which workpieces travel; the gate however may be readily opened to permit workpieces to drop through the opening; wherein a retainer is longitudinally supported over the carrier rail to prevent workpieces mounting upon one another during their travel or escaping from the chuting; wherein the chuting is so constructed and arranged that dirt cuttings, or lubricant off the workpieces may drop from the chuting so that the latter is largely self-cleaning; wherein readily adjustable means are provided for accelerating or decelerating the flow of workpieces around curves formed in the chuting; and wherein the side and carrier rails may be easily spliced to increase their length by the use of spacing and fastening means normally employed at intervals throughout the length of the chuting.

With these and other objects and advantages in view which will become apparent as the specification proceeds, the invention is hereinafter more fully described with the aid of the accompanying drawings, in which:

Figures 1 and 2 are perspective views of a coil of side rail material and a coil of carrier rail material, respectively.

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Figure 3 is a side view showing a straight portion of the chuting; Figure 4 is a section on the line 4—4 of Figure 3, and Figure 5 is a section on the line 5—5 of Figure 3.

Figure 6 is a cross section of a slightly modified form of chuting wherein a plurality of laterally spaced carrier rails are employed.

Figure 7 is a perspective view showing a portion of the chuting curved and tilted laterally to decelerate the flow of workpieces therealong; and Figure 8 is a similar view but showing a curved portion of chuting laterally tilted to accelerate the flow of workpieces.

Figure 9 is a plan view of an escape gate provided in the chuting intermediately of its length; and Figure 10 is a section on the line 10—10 of Figure 9.

Figure 11 is a plan view of chuting some of which is straight and some of which is laterally curved.

Figure 12 is a plan view showing another modification wherein a channel shaped carrier rail is employed which is continuous along a straight portion of the chuting and formed in short, separate lengths around a curved portion thereof; and Figures 13 and 14 are sections on the lines 13—13 and 14—14, respectively, of Figure 12.

Figure 15 is a plan view of a piece of chuting shaped in the form of a descending spiral, and Figure 16 is a view on the line 16—16 of Figure 15.

Figure 17 is a plan view showing a spliced portion of the chuting.

Referring to the drawings, the side rails 1 and the carrier rails 2, which are usually made of resilient material such as spring steel, are usually shipped in coils as shown in Figures 1 and 2, respectively, and are cut to length and assembled where the chuting is to be installed. The side rails 1 consist of flat stock having longitudinally aligned, spaced slots 3 formed therethrough intermediately of their height. The slots are usually nearer the lower edge faces of the rails, and the length of the slots is greater than the distance between their adjacent extremities. The carrier rail or rails 2, which are also generally made of flat stock, having longitudinal apertures 4 formed therethrough the length and spacing of which is substantially the same as that of the slots 3 in the side rails 1. The carrier rails 2 are shallower than the side rails 1 and their longitudinal apertures are frequently formed to extend centrally of the height of the rails so that if their upper edge faces become marred, as for instance if the chuting is employed for the transfer of hardened parts such as gears the teeth of which roll along the carrier rails, the said rails may be readily removed and inverted to provide fresh work supporting surfaces.

Extending transversely through opposed slots 3 and apertures 4 in the side rails 1 and the carrier rail or rails 2, respectively, are bolts 5 on which spacers 6 are mounted between adjacent pairs of rails to retain them in their proper, spaced relation. Nuts 7 are secured on the bolts 5 to hold the rails and spacers in engagement. If the chuting is to be straight the nuts are then tightened. If the chuting is to be curved for at least a portion of its length the bolts 5 are secured to retain the rails 1 and 2 in spaced relation up to the point where the curvature is to commence. From that point other bolts 5 having spacers 6 thereon between adjacent rails are loosely arranged through the slots 3 and apertures 4 and the rails are then flexed to assume the required curvature, after which the nuts 7 are tightened to retain the chuting in its flexed form. Due to the length of the slots, or apertures, and the relative closeness of the adjacent slots, or apertures, to one another, although a greater length of rail is required to extend around the outer side of a curve than around the inner

side, it is possible under all circumstances to so locate the bolts that they are substantially uniformly and sufficiently closely spaced. The rails may of course be curved as required at different locations along their length so that the chuting will follow any desired path, as for instance a partly straight and partly curved path as shown in Figure 11. Or again the chuting may be shaped substantially in spiral form such as the descending spiral shown in Figures 15 and 16. Again irrespective of its lateral form, that is whether straight or curved, the chuting may include either one or a plurality of carrier rails, and in the latter case a spacer 6 is employed between each pair of adjacent rails as shown in Figure 6.

The speed of flow of workpieces around curved portions of the chuting may be to some extent accelerated or decelerated by the means illustrated in Figures 7 and 8. In either case one or more suitable brackets 10 are adapted to be attached to any fixed member 11, and at least one substantially vertically extending arm 12 is secured against the outer face of one of the side rails 1 as by one of the bolts 5. Threaded through each bracket 10 is a screw 13 which when screwed inwardly forces the outer extremity of one arm 12 laterally to tilt the chuting which is adapted to be supported at its extremities by means not shown. When the speed of workpieces travelling around the curve is to be reduced the screw 13 is located to force the side rail on the outer side of the curve downwardly, Figure 7, below the opposite side rail; and when the speed of workpieces travelling around the curve is to be increased the screw 13 is tightened against the side rail on the inner side of the curve to force it downward, Figure 8, and thereby banking the curve. The number of such tilting means required depends upon the angular distance through which the curve extends; and again the arm 12 may either be integral with or separate from a bracket 16 hereinafter referred to.

In order to prevent workpieces mounting upon one another while travelling along the chuting, and to prevent them spilling therefrom, a suitable retainer 15 is mounted longitudinally over the carrier rail 2. The retainer may consist of a rod or other suitable element mounted at intervals in supports 16 projecting upwardly from and secured to one of the side rails 1 by the bolts 5.

To permit removal of one or more of the workpieces from the chuting intermediately of its length a break or gap is formed in the carrier rail, and the gap is bridged by an escape gate 18, Figures 9 and 10, which at one extremity is pivoted on one of the bolts 5 and has hooks 19 on its opposite extremity to engage the spacers 6 adjacent and beyond the opposite extremity of the gap. Normally such a gate serves to carry workpieces across the gap but, when desired, may be turned about the axis of its supporting bolt into the position indicated at 18a. In order to facilitate movement of the escape gate it may be secured on its supporting bolt as by a pin 5a for rotation therewith, and one extremity of that bolt may be cranked as shown at 5b.

Figures 12, 13 and 14 show a slightly modified form of construction wherein the carrier rail 2a is of inverted channel section for use when the nature of the workpieces which are to travel therealong is such that they might be damaged by riding upon narrow edge faces of one or more flat rails. In this case the channel-shaped carrier rail 2a is held in spaced relation to and between the side rails 1 by spacers 6, each extending between one side rail and the adjacent flange of the channel-shaped rail 2a, mounted on bolts 5. Along straight lengths of chuting the carrier rail 2a is continuous, but around curved portions thereof the carrier rail consists of a series of short, separate lengths of rail 2b of the same cross section and arranged longitudinally. The longitudinal extremities of the carrying surfaces of these lengths 2b are outwardly curved as shown at

2c so that irrespective of inclination of adjacent lengths to one another portions of their work carrying surfaces are contiguous so that workpieces may slide freely from one length to the next. In this case opposed apertures 4a are formed through the flanges of each rail length for the passage of a bolt 5. The opposed flanges of the lengths 2b project beneath the side rails 1 and are horizontally slotted from opposite extremities intermediately of their height. The lower extremities of the split portions of the flanges are outwardly bent as shown at 2d to extend beneath and engage the undersides of the side rails 1 and hold the short lengths against pivotal movement on their bolts 6.

If it is desired to lengthen existing chuting, due to the resilience of the rails 1 and 2, which are usually made of spring steel, each may be readily spliced to a similar piece of rail, as shown in Figure 17, by arranging the ends of pairs of rails in overlapping relation and inserting bolts 5 through the overlapping slots 3 and apertures 4 and through spacers between each of said pairs. After a production run is finished the chuting may be easily dismantled and re-assembled to assume a different shape to extend between two points differently spaced from one another. Again, the width of the chuting may be changed by the insertion of spacers of a different length. It will also be noted that the construction of the chuting and the provision of the elongated slots and apertures readily lends itself for attachment thereto of different forms of switches and other mechanisms which may be needed for controlling the flow of workpieces therealong, and of suitable support means therefor neither of which are shown.

Though in the drawings only portions of the chuting are shown it is of course understood that both the escape gate and the retainer form necessary parts thereof, as does the tilting means in cases when curved portions of the chuting require its use. It will also be seen from the foregoing that transverse alignment of the extremities of the slots and apertures in the rails is not necessary, and even if they were all in true alignment at one end of the chuting they would be misaligned at the other end if a portion of the chuting were curved, consequently rail lengths may be cut as required from coils without regard to the positions of the slots and apertures relative to the ends of the rails.

While in the foregoing the preferred embodiments of the invention have been described and shown, it is understood that further alterations and modifications may be made thereto provided they fall within the scope of the appended claims.

What I claim is:

1. Chuting including opposed side rails each having a plurality of aligned longitudinal slots therethrough, the length of the slots being greater than the distance between their adjacent extremities, at least one carrier rail extending longitudinally between the side rails, said carrier rail having a plurality of longitudinally aligned apertures therethrough, the distance of the slots beneath the tops of the side rails being greater than that of the apertures beneath the top of the carrier rail, spacers between adjacent pairs of rails, and fastening means extending through the slots and apertures for securing the rails in spaced relation throughout their length.

2. Chuting including opposed side rails each having a plurality of aligned longitudinal slots therethrough, the length of the slots being greater than the distance between their adjacent extremities, at least one carrier rail extending longitudinally between the side rails, said carrier rail having a plurality of aligned longitudinal apertures therethrough, the length of said apertures being greater than the distance between their adjacent extremities, the distance of the slots beneath the tops of the side rails being greater than that of the apertures beneath the top of the carrier rail, bolts extending transversely through said slots and apertures, spacers on the bolts between each

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adjacent pair of rails, and nuts on the bolts for securing the rails in spaced relation.

3. Chuting including flat side rails having aligned longitudinal slots therethrough, at least one flat carrier rail having aligned longitudinal apertures, said carrier rail extending longitudinally between the side rails, said side rails extending upwardly beyond the carrier rail, all the rails being resilient and adapted to be flexed along at least portions of their length about a common axis, spacers between the rails, and fastening means extending transversely through the slots and apertures for retaining the rails in uniformly spaced relation throughout their length and the flexed portions of said rails at their curvature about the common axis.

4. Chuting including opposed side rails having at least one carrier rail extending longitudinally between them, the side rails having a plurality of aligned longitudinal slots therethrough the length of each of which is greater than the distance between their adjacent extremities, the carrier rail having a plurality of aligned longitudinal apertures therethrough the length of each of which is greater than the distance between their adjacent extremities, the slots being a greater distance beneath the upper margins of the side rails than the apertures are beneath the upper margin of the carrier rail, all said rails being resilient and adapted to be flexed about a common axis for at least a portion of their length, bolts extending through and laterally slidable in the slots and apertures to permit the flexing of said rails, spacers on the bolts between each adjacent pair of rails, and nuts on said bolts for securing the rails in spaced relation and for maintaining the desired curvature of said flexed portions about their common axis.

5. Chuting including resilient side rails having a plurality of aligned longitudinal slots therethrough, the length of the slots being greater than the distance between their adjacent extremities, said rails being adapted to be flexed about a common axis for a portion of their length, fastening means extending transversely through the slots for holding the rails in spaced relation and their flexed portions at the required curvature, and a carrier rail spaced longitudinally between the side rails by the fastening means.

6. The combination in claim 5, wherein the carrier rail is inflexible and between the curved portions of the side

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rails consists of a plurality of short separate lengths arranged contiguous to one another.

7. The combination in claim 5, wherein the carrier rail is of channel section which between the curved portions of the side rails is divided into separate short lengths, said carrier rail having apertures formed transversely through its flanges for the passage of the fastening means.

8. The combination in claim 5, wherein the carrier rail is of inverted channel section divided between the curved portions of the side rails into a plurality of short lengths, said carrier rail having apertures formed through its opposed flanges for the passage of the fastening means, and flexed portions integral with the flanges of the short lengths in engagement with the side rails for preventing said short lengths rocking about their fastening means.

9. Chuting including opposed side rails, a carrier rail extending longitudinally between them, fastening means extending transversely through all the rails for holding them in spaced relation, the carrier rail being divided between two adjacent fastening means into two longitudinally spaced portions and forming a gap between them, an escape gate pivoted on the fastening means adjacent one extremity of the gap, means carried by the rails beyond the opposite extremity of the gap for normally supporting the outer extremity of the gate whereby said gate forms a bridge extending between the two portions of the carrier rail, and means for moving the escape gate to permit workpieces travelling along the carrier rail to drop through the gap.

10. The combination in claim 1, including mounted on the fastening means and projecting over the carrier rail, and a longitudinal retainer carried by the supports for preventing workpieces on the carrier rail mounting upon one another.

11. The combination in claim 3, including an arm secured to one of the side rails and projecting substantially vertically therefrom adjacent a flexed portion of the side rails, a bracket adapted to be secured to a fixed member, and means adjustable on the bracket for exerting pressure against the arm and tilting the chuting laterally to regulate the speed of flow of workpieces around said flexed portion.

No references cited.