

Feb. 18, 1947.

N. M. EDSON ET AL

2,415,941

SELECTING MECHANISM

Filed Oct. 13, 1943

4 Sheets-Sheet 1

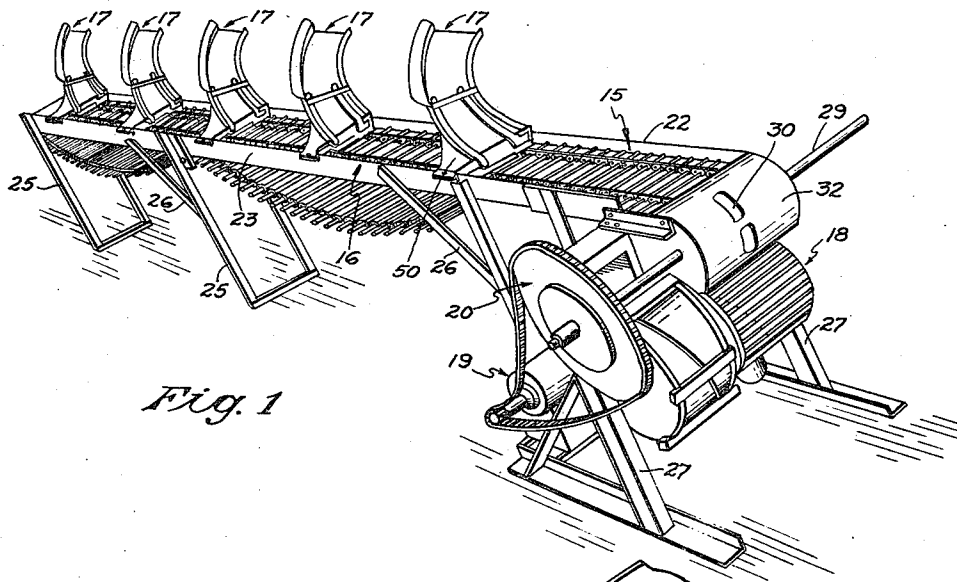


Fig. 1

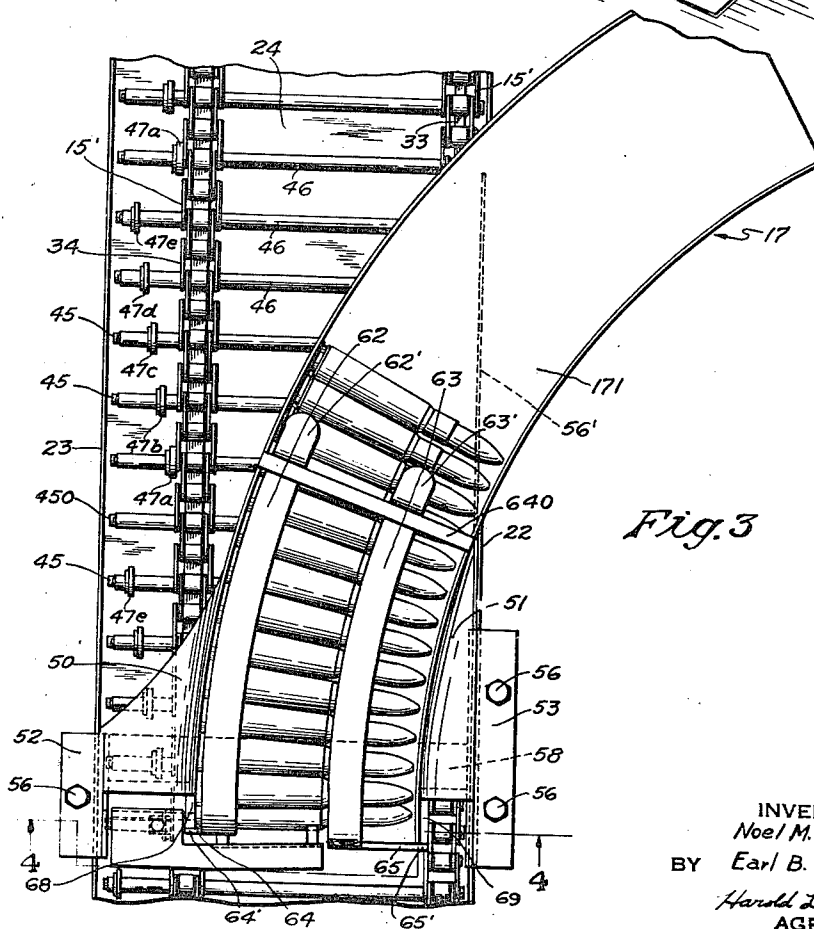


Fig. 3

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Fig. 2

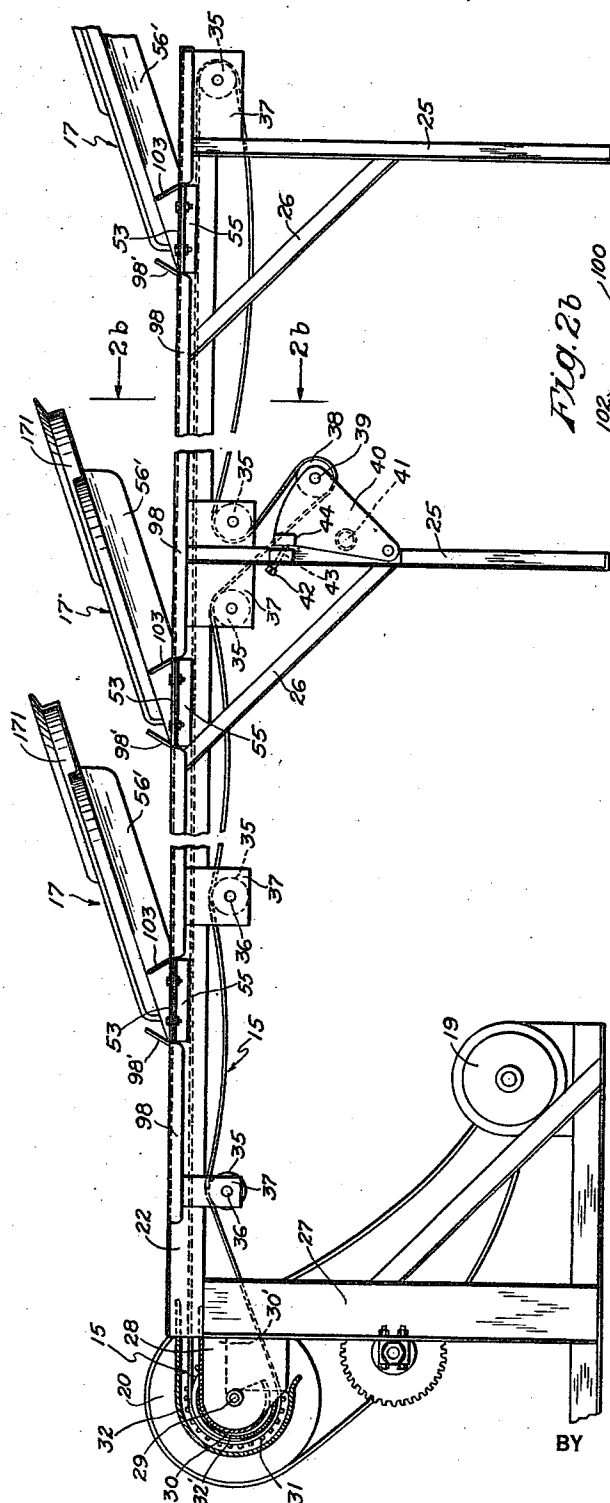
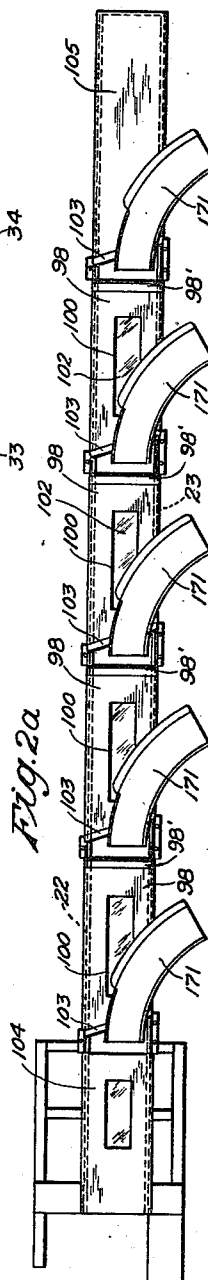


Fig. 2b



Fig. 2a



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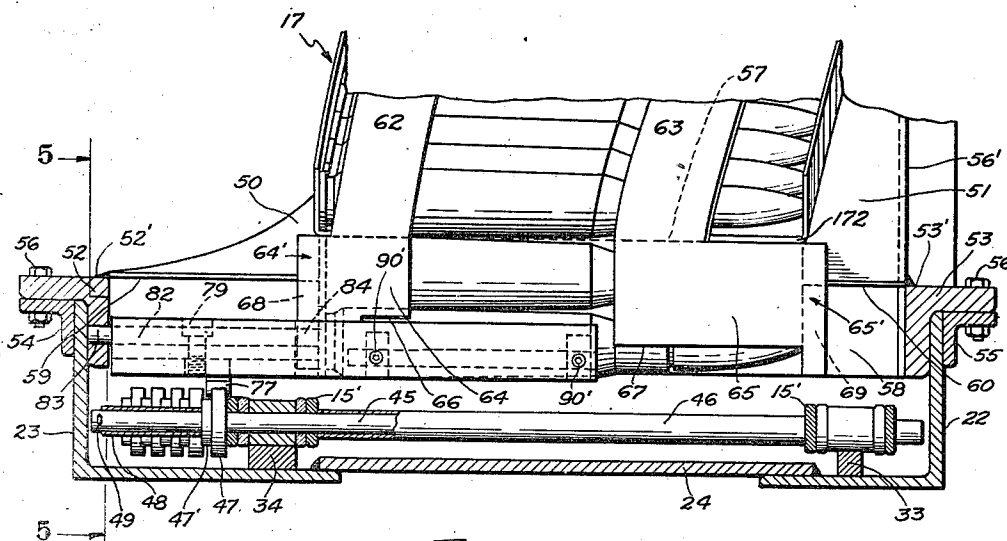


Fig. 4

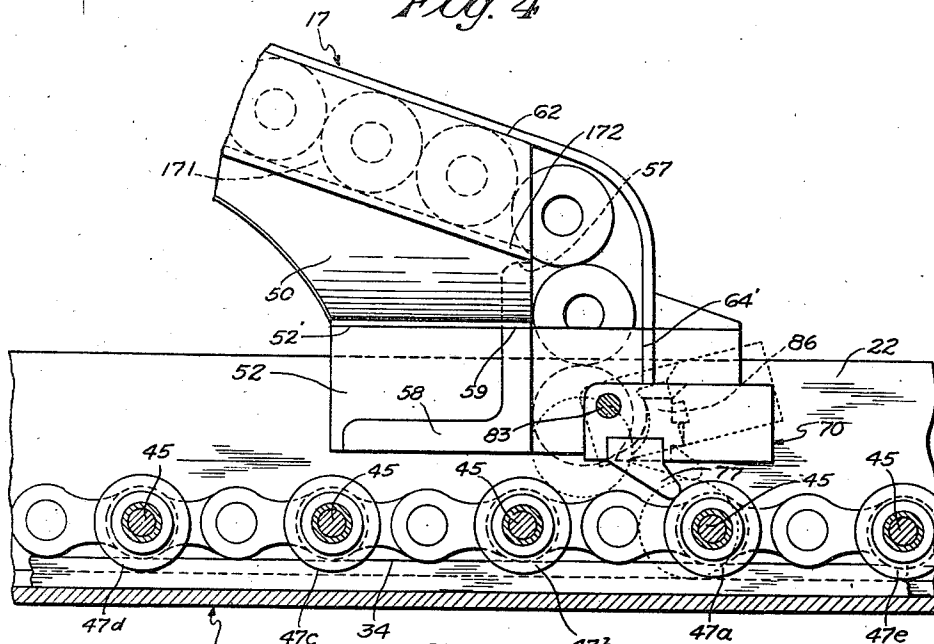


Fig. 5

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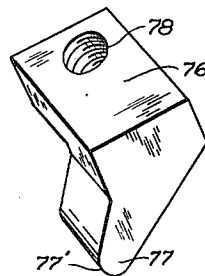
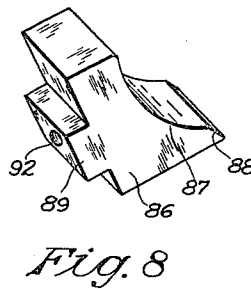
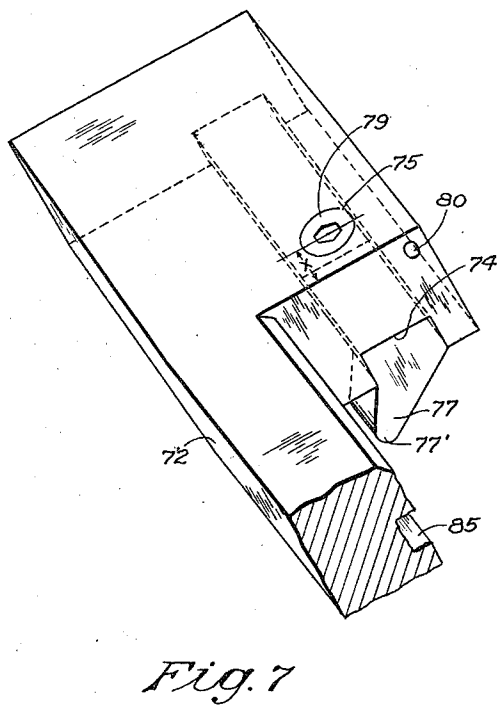
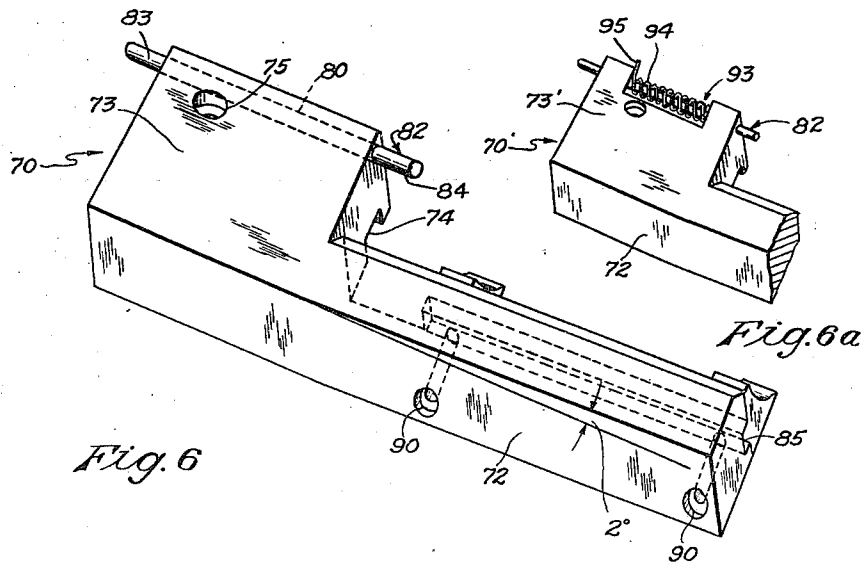
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,415,941

SELECTING MECHANISM

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Application October 13, 1943, Serial No. 506,064

2 Claims. (Cl. 198—79)

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The present invention relates, in general, to an article feeding machine, and, particularly, to a machine for selectively arranging a plurality of articles in predetermined sequence.

In modern warfare, small arms ammunition, and, especially .50 caliber cartridges, are used extensively in machine guns of aircraft, and, to this end, the cartridges are assembled in continuous belts which, in some instances, consist of two hundred and sixty-five rounds of ammunition.

The assembly of these machine gun ammunition belts is not a part of the present invention but suffice it to say that these belts are commonly formed by joining together the individual cartridges by suitable interconnected links which encircle each cartridge and are adapted to be automatically disconnected and slipped off of a case when the cartridge is fired in the machine gun. Moreover, for tactical reasons, it is desirable that these belts should comprise cartridges of various types, that is to say, .50 caliber armor piercing, .50 caliber incendiary and .50 caliber tracer arranged in a predetermined sequence; as for example, three armor piercing cartridges may be followed by one incendiary and one tracer or two armor piercing cartridges may be followed by one incendiary and two tracers. Obviously, a number of variations in sequence of the cartridges may be had depending upon the particular tactical problem to be met.

Heretofore, the methods and means for assembling the various types of cartridges in a predetermined sequence for assembly in ammunition belts have been slow and laborious and wholly inadequate to meet the exigency of present day demands.

For the purposes of illustration only, the present invention will be described with reference to an improved machine, an object of which is to automatically feed .50 caliber cartridges of various types to a link belt loading device and in predetermined sequence, but it will be clearly understood that the invention is not limited to the particular machine shown or to the use described, but may have other uses and may be embodied in modifications within the scope of the appended claims.

Other objects, features and advantages of the invention will be described in greater detail in the following specification and illustrated in the accompanying drawings in which:

Fig. 1 is a perspective view of the machine of this invention adapted to selectively arrange a plurality of cartridges of different types in predetermined sequence.

Fig. 2 is a side elevation of the machine partly in section showing the front and rear ends and a fragmentary intermediate portion.

Fig. 2a is a diagrammatic plan view of the machine showing covers for the conveyor chain.

Fig. 2b is a sectional elevation on line 2b—2b of Fig. 2.

Fig. 3 is a fragmentary plan view of the machine showing the conveyor chain and one of the chutes for delivering cartridges onto the chain.

Fig. 4 is a front elevation, partly in section, of the conveyor chain and trough on line 4—4 of Fig. 3.

Fig. 5 is a fragmentary side elevation, partly in section, of the conveyor chain and trough on line 5—5 of Fig. 4 showing the gate in both its normal and displaced positions.

Fig. 6 is a perspective view of the gate.

Fig. 6a is a fragmentary perspective view of a modification of the gate shown in Fig. 6.

Fig. 7 is a fragmentary perspective view of the gate of Fig. 6 showing the gate trigger assembled thereon.

Fig. 8 is a perspective view of one of the article retaining fingers shown on the gate in Fig. 6.

Fig. 9 is a perspective view of the gate trigger.

Referring to the drawings, the machine of this invention comprises, in general, an endless conveyor chain 15, see Fig. 1, adapted to be moved longitudinally through a trough 16, cartridges being fed successively and in predetermined sequence to the chain from a plurality of chutes 17 mounted on the trough above the chain 15.

In the present invention, the cartridges which have been selectively deposited on the chain from the chutes 17, as hereinafter described, are carried by the chain over the end of the trough into a suitable belt linking device, indicated generally at 18, from which complete cartridge belts of two hundred and sixty-five rounds are stripped. The belt linking device and conveyor chain 15 are adapted, as shown and hereinafter described, to be driven from a single power source 19 by means of a suitable chain and sprocket drive 20.

It will be understood, however, that the belt linking device, illustrated at 18, does not form a part of the present invention, and that, consequently, the conveyor chain 15 may be driven independently of the belt linking device and that the conveyor chain may deliver cartridges or other similar articles to means other than a belt linking device depending upon the particular use of which the conveyor chain is to be put. The belt linking device shown is merely illustrative of one use of the conveyor chain and forms the

subject of a separate copending application, Serial No. 506,065 filed October 13, 1943.

The trough 16 is shown in detail in Figs. 2 and 2b and comprises a pair of angle iron members 22 and 23 arranged longitudinally in spaced parallel relation, their vertically disposed sides forming the sides of the trough and their horizontal inwardly extending sides forming flanges which, as shown, are spanned by a substantially flat rectangular bed plate 24. The longitudinal edges of the latter are secured to the horizontal flanges of the angle iron members by soldered or welded joints. The trough is supported on the floor or other base by pairs of angle iron legs 25 fastening at their upper ends to the vertical walls of the trough and braced by suitable brackets 26. The front end of the trough is supported by a pair of legs 27 which are somewhat sturdier than the legs 25 and comprise channel members, each having a bearing plate 28 secured thereto arranged to rotatably support the main drive shaft 29, the latter being driven from the power source 19 by the sprocket wheel and chain 20.

As shown in Fig. 2, the main shaft 29 carries an article supporting drum-shaped feeding head 30 having a rearwardly extending portion 30' by which it is suitably fastened to the forward end of the frame, the conveyor chain, indicated diagrammatically at 15, being made to move forwardly along the trough and over the periphery of the feeding head 30 as hereinafter described. A cylindrical shield or cover 32 is shown fastened to the frame in spaced substantially concentric relationship around the periphery of the feeding head 30 to hold the cartridges in the conveyor chain, the cartridges being supported on the periphery of the feeding head as the chain moves thereover. A relatively narrow, flat band 32' may be arranged around the feeding head adjacent one end thereof and eccentric thereto to support the tapered ends of the cartridges so as to prevent the cartridges from jamming between the links of the chain.

The conveyor chain 15, shown in detail in Figs. 3 and 4, comprises a pair of link roller chains 15' fastened together in spaced parallel relationship by rods 45. To this end, the ends of each rod extend through and serve to join together every other link respectively of the two chains, that is to say, every other rivet of the usual type of roller link chain is removed and one end of a rod 45 substituted therefor. The two chains are held in spaced parallel relation by sleeve members 46 carried on the rods 45, the opposite ends of each sleeve abutting the inner faces of the adjacent links of the chain.

The roller links of each chain are adapted to ride and to be guided over the bed 24 of the trough by a pair of rails 33 and 34 which comprise longitudinal bars substantially rectangular in cross section welded or otherwise secured to the bottom of the trough. The belt is moved along the rails by providing a pair of laterally spaced sprocket wheels 31 keyed to the drive shaft 29 at opposite ends of the feeding head 30, the teeth of the sprockets being adapted to be engaged in the links of the respective chains thereby to draw the belt over the periphery of the feeding head 30.

The belt is supported beneath the trough during its return movement from the front to the rear thereof by pairs of laterally spaced rollers 35 mounted on axles 36 which are supported at their opposite ends, transversely of the trough,

in bearing plates 37 which depend from the vertical walls thereof.

Suitable means for tightening the belt is shown in Fig. 2 and comprises a pair of rollers 38 rotatably mounted at opposite ends of an axle 39, the ends of which are supported in a pair of sector-shaped plates 40 fastened together in laterally spaced relationship by a spacer bar 41, each plate 40 being pivotally supported at its apex to one of the pairs of legs 25 of the trough. Suitable members for adjusting the position of the rollers 38 so as to tighten the belt are shown at 42 and comprise a pair of headed bolts, each being threadedly secured in a tapped angularly disposed hole of a block 43 suitably fastened on a leg 25 of the frame, the projecting end of each bolt being adapted to engage an anvil block 44 which is welded or soldered to the adjacent edge of each pivoted sector plate 40. Thus, by advancing the bolts 42 forwardly, the sectors are moved outwardly clockwise, as shown in Fig. 2, thereby tightening the belt 15.

Referring to Fig. 4, the right-hand end of each rod 45 of the belt extends a relatively short distance beyond the outside links of the right-hand chain 15' while the opposite or left-hand end of each rod 45, hereinafter termed the trigger end, extends a relatively long distance beyond the outside links of the left-hand chain 15'. Mounted on the trigger end of each rod 45 is a trigger selecting member comprising a disk 47 provided with a hub portion 47'. The disk 47, shown in Fig. 4, is located on the trigger end of the rod 45 immediately adjacent the outside link of the respective chain 15' being held in this position against movement along the rod by means of a sleeve 48 of such length that its one end abuts the hub portion 47' of the disk 47 and its opposite end abuts a stop means such as a cotter pin 49 suitably fastened in the outer end of the rod 45.

As shown in Figs. 1, 3 and 4, not all of the trigger selecting disks 47 are located at the same point on the trigger ends of the rods. In the embodiment shown, each disk 47 of a set of five disks is located at a different position on the trigger end of its respective rod 45, these distances varying from the innermost position hereinafter identified as position *a* to the outermost position *e*, see Fig. 3, wherein disk 47*e* is at the extreme outer end of its respective rod 45.

Although five differently positioned disks are shown, it will be understood that more or less than five different positions may be used depending upon both the number of different types of cartridges to be assembled and the particular sequence desired. Moreover, since the conventional link belt for aircraft machine guns comprises two hundred and sixty-five cartridges, the conveyor belt or chain 15 comprises two hundred and sixty five rods 45, each consecutive set of five rods having selecting disks 47 arranged thereon as described above; and an additional rod 450 having no selecting disk. The purpose of this additional rod 450 is to interrupt the continuous feeding of cartridges to the conveyor belt, as hereinafter described, so that during the subsequent belt linking process, the failure of a cartridge to be fed to the linking device will cause a break in the cartridge belt each time a belt of two hundred and sixty five cartridges has been completed, and thus, instead of forming a continuous unending belt, separate belts each containing two hundred and sixty five cartridges will

be automatically delivered from the belt linking device.

Cartridges are fed to the conveyor chain or belt 15 from suitable chutes 17, five being shown in the present embodiment, each chute being supplied manually with one type of cartridge. Since all of the chutes are identical, for the sake of brevity only one chute will be described in detail. Each chute comprises an arcuate sheet metal trough 171 substantially equal in width to the length of a standard cartridge and provided with laterally extending webs 50 and 51 adjacent its lower discharge end. The web 50 is shown welded along its outer edge to a horizontally disposed flange 52' of a bracket 52 which is fixedly supported on the upper edge of the trough 17 on the side 23 thereof by means of a second bracket 54 and a bolt 56, the bracket 54 being welded or otherwise fastened to the outside of the trough. A bracket 53 is similarly supported on the side 22 of the trough by a second bracket 55 and a pair of bolts 56 and provides a horizontally disposed flange 53' for supporting the web 51 as hereinafter described.

As shown in Fig. 2, each chute is provided with a rib 56' comprising a flat strip of metal welded along a portion of its upper edge to the underside of the trough, see dotted lines in Fig. 3, to provide a stiffening member and means for supporting the chute in an inclined position with respect to the chain conveyor. The lower exposed upper edge of the rib 56' provides a support for the outwardly extending edge of the web member 51 to which the latter may be welded. As shown, the lower side of the rib 56' lies squarely against the vertical side of the bracket 53 and is secured thereto by a welded joint along the horizontal flange portion 53' of the bracket 53.

The lower end 172 of each chute rests on the upper edge 57 of an angle iron bar 58 which extends horizontally between the spaced parallel sides 22 and 23 of the trough being welded at each end to the corresponding inner faces thereof. It will be seen in Fig. 4 that the upper edges of the bar at opposite ends thereof are cut down so as to form shoulders 59 and 60 which lie in substantially the horizontal plane of the flanges 52' and 53' respectively and which provide supporting edges for the lower ends of the web pieces 50 and 51 respectively.

Suitable means for guiding the cartridges as they move by gravity down a chute 17 comprise a pair of metal straps 62 and 63, each strap being located adjacent opposite sides of the chute and supported therein at their upper ends by means of a transverse tie 640. The latter is fixedly supported at its opposite ends on the upper edges of the sides of the chute, the straps 62 and 63 being welded in suitably spaced relationship on the underside of the tie. The extreme upper end 62' and 63' respectively of each strap is bent upwardly slightly to insure passage of the cartridges beneath the straps.

The lower end of each strap is provided with a laterally extending substantially vertically disposed apron 64 and 65 respectively adapted to extend out in front of the cartridges at the lower end 172 of the chute so as to enable the cartridges to move thereover, the cartridge being guided thereby to fall from the chute in a substantially vertical plane. Each apron is provided with a substantially rectangular notch 66 and 67 respectively in its lower edge to accommodate a gate hereinafter described.

The outer ends 64' and 65' respectively of the aprons are adapted to overlie the forwardly extending ends of a pair of spacer blocks 68 and 69 which, as shown in Fig. 3, are welded at their rear ends to the front face of the transverse angle bar 58 and at their front ends to the overlying ends 64' and 65' of the aprons 64 and 65. Thus, the lower ends of the straps 62 and 63 are securely held in proper position relative to the chute 17 so as to guide the cartridges being discharged therefrom.

Suitable means for holding the column of cartridges in the chute and enabling cartridges to drop out of the chute successively comprises a gate 70, shown in Fig. 6, which comprises an L-shaped block having a leg portion 72 which makes an angle of substantially 2° with a foot portion 73. A substantially rectangular slot 74 is formed on the underside of the foot 73 and extends the full length thereof. A counterbored hole 75 is drilled substantially vertically through the foot 73 on the longitudinal axis of the slot 74 and at a distance x from the inner edge thereof. The distance x will be different for each of the five gates shown in the present embodiment, each distance x being adapted to correspond to each of the five different positions of the selector disks 47a, 47b, 47c, 47d and 47e of the conveyor chain as hereinafter described.

The actuation of each gate 70 is accomplished by providing a trigger member on each gate which comprises a substantially rectangular block 76 dimensioned to fit in the slot 74 of the gate and provided with a vertically tapped hole 78 and a depending forwardly inclined trigger 77 having a rounded nose 77'. The trigger block is adapted to be assembled in the slot 74 of the gate and secured therein by means of a suitable screw 79, the latter being seated in the counterbored hole 75 of the gate and threadedly engaged in the tapped hole 78 of the trigger member. The distance x of the counterbored hole 75 from the inner edge of the foot 73 thus determines the position of the trigger in the gate, the trigger block 76 being capable of sliding movement in the slot 74 until its tapped hole 78 lies opposite the counterbored hole 75 of the gate. In the present embodiment the distance x of each of the five gates is different, each distance x being so chosen that the trigger 77 of each respective gate 70 will be engaged by corresponding selector disks 47a, 47b, 47c, 47d and 47e of the conveyor chain.

Each gate 70 is adapted to be pivotally supported adjacent the discharge end 172 of one of the chutes 17 and to this end a hole 80 is drilled transversely through the foot portion 73 of the gate adjacent the top rear edge thereof. A suitable pin 83 is inserted in the hole 80 and is of sufficient length so that the opposite ends of the pin extend beyond each edge of the foot 73. The outwardly extending ends of the rod 82 form trunnions 83 and 84 for pivotally supporting the gate in operative position.

As shown in Fig. 4, the trunnions are mounted in axially aligned horizontally drilled holes in the vertical wall of the bracket member 52 and in the spacer block 68 respectively. It will be clear that the pivot point of the gate is displaced rearwardly of the geometrical center thereof so that the forward end of the gate will normally pivot downwardly by gravity in a clockwise direction as seen in Fig. 5 for the purpose hereinafter described.

The rear face of the leg 72 of each gate 70 is

provided with a rectangular longitudinally extending slot 85 which is adapted to rigidly support a pair of cartridge engaging fingers which, as shown in Fig. 8, comprise blocks 86, each having a concave face 87 and tapered edge 88 on one side and a rectangular tongue 89 on its opposite side. The width of each tongue corresponds substantially to the width of the slot 85 in the leg 72 of the gate, the tongue being adapted to make a substantially tight fit in the slot.

Suitably drilled and counterbored bolt holes 90 are formed in the leg of the gate on the longitudinal axis of the slot 85, these holes being spaced apart a predetermined distance found to be best suited for locating the fingers 86 with respect to the cartridge cases in the chute. The finger blocks 86 are adapted to be assembled and securely held in the slot 85 by suitable bolts 90' threadedly secured in tapped holes 92 in the tongue portion 89 of each block.

It will be clear that the slight angularity of the leg 72 of the gate relative to the foot portion 73 thereof compensates for the slight taper of the cartridge case and enables the concave surfaces 87 of both fingers 86 to partially encompass the case at the two predetermined spaced points thereon.

Although the configuration of both finger blocks 86 is substantially identical, the concave surface 87 of the outer finger may be of somewhat smaller radius so as to further compensate for the tapered dimensions of the cartridge case.

It will be evident, as shown in Fig. 5, that due to the pivotal mounting of the gate, the force of gravity acts thereon to pivot the front of the gate downwardly so that the rearwardly extending fingers 86 of the gate are normally maintained with their concave faces 87 in engagement with the cartridge case which is at the lower end of the chute 17 whereby the case is effectively supported and prevented from dropping out of the chute until such time as the fingers are displaced by actuation of the gate.

Thus gravity is the only force tending to hold the fingers 86 in engagement with the cartridges, but it will be understood that additional means may be utilized to augment the force of gravity.

Referring to the modification shown in Fig. 6a, the foot portion 73' of the gate 70' is formed by cutting a rectangular slot 93 in the rear face of the foot 73' thereby forming a yoke portion through which the pivot rod 82 passes. Mounted on this rod within the slot 93 is a coil spring 94 having an upwardly extending end 95 adapted to bear against a fixed part of the trough such as the front face of the transverse bar 58, the opposite end of the spring being adapted to bear against the rear wall of the slot 93. In this manner, the gate will be positively urged by the force of the spring 94 to pivot clockwise, thus augmenting the force of gravity to hold the fingers 86 in engagement with the underside of the lowermost cartridge in the chute.

The actuation of a gate by one of the disks is shown in Fig. 5. As a selector disk, in this instance 47a, engages the nose portion 77' of the trigger 77 of a gate 70, the latter is pivoted counterclockwise, see dotted lines, so that its cartridge retaining fingers 86 are withdrawn from beneath the lowermost cartridge in the chute, thereby enabling this cartridge to drop down onto the conveyor chain into an aperture between the rods 45. The cartridges in the chain are thus actually supported on the bed 24 of the trough and are moved thereover by the move-

ment of the chain through the trough. As soon as the selector disk 47a has advanced sufficiently to release the nose 77' of the trigger 77, the gate drops down either by the force of gravity alone or augmented by the force of the spring 94 to its normal position wherein the fingers 86 engage and hold the next succeeding cartridge in the chute 17 until the trigger 77 is again engaged by one of the selector disks 47a of the conveyor belt. It will be understood that since this particular gate 70 is actuated only by selector disks 47a, cartridges will be delivered from the corresponding chute 17 only into every fifth aperture of the conveyor belt.

Referring to Figs. 2a and 2b, the trough 17 is shown provided with covers for preventing foreign articles from falling into the conveyor belt, in which event a jam or other malfunction would occur.

The covers 98 comprise thin sheet metal stock substantially rectangular in shape and provided with longitudinal down-turned edges 99 which are adapted to overlie the edges of the trough 16, as shown in Fig. 2b. A suitable rectangular aperture 100 is provided in each cover, each aperture being closed by a transparent window 102 of glass or other suitable plastic material. The rear end of each cover 98 is square and provided with an upwardly and rearwardly extending lip 98' whereas the forward end is cut at an angle to make allowance at one side for the rib 56' which, as shown in Fig. 2, extends vertically from beneath each chute. A forwardly and upwardly extending lip 103 is provided on the front edge of each cover, the lips 98' and 103 being adapted to provide additional protection for the belt and gates and to enable ready removal of the covers. The front end of the foremost cover 104 is shown square, but in other respects the cover 104 is substantially identical to the covers 98. The rear cover is shown at 105 substantially identical to the covers 98 but is not provided with a window.

The operation of the machine is as follows: Assuming, for the purpose of illustration, that a cartridge belt is to be formed consisting of two hundred and sixty-five cartridges arranged in successive series of five cartridges, each series of which comprises two armor piercing, one incendiary and two tracer bullets. The two rearmost chutes 17, see Fig. 1, are filled with armor piercing cartridges, the middle chute with incendiary cartridges and the two foremost chutes with tracer cartridges. The gate 70 on the rearmost chute may, for example, be chosen to mount a trigger 77 at position x thereon so as to be actuated by the selector disks 47a of the conveyor chain. The next chute would be provided with a gate having a trigger 77 located thereon so as to be actuated by the selector disks 47b of the conveyor chain. Similarly, the middle chute and the two foremost chutes would be provided with gates adapted to be actuated by selector disks 47c and 47d, 47e respectively.

Thus, as the conveyor chain is moved forwardly through the trough, the selector disk 47a will actuate the gate 70 of the rearmost chute 17 and release a cartridge therefrom onto the chain, the next succeeding selector disk 47b will pass by the trigger 77 of the rearmost gate 70 without engagement therewith, but will engage and actuate the trigger 77 of the next gate thereby discharging a second armor piercing cartridge onto the chain. The selector disk 47c will pass freely by the triggers 77 of the two rearmost chutes but

will engage and actuate the trigger 77 of the center chute thereby releasing an incendiary cartridge onto the chain immediately following the two armour piercing bullets. The two succeeding selector disks 47d and 47e will pass freely by the triggers of the rearmost and center chutes but will engage and successively actuate the triggers of the foremost chutes respectively thus discharging two tracer cartridges onto the belt immediately succeeding the two armour piercing and the incendiary cartridge. In this manner, fifty-three successive series of selectively arranged sets of five cartridges are discharged onto the conveyor chain. Thereafter the rod 450 of the conveyor chain passes beneath the chutes, but, since this rod carries no selector disk, none of the gates will be actuated and hence no cartridges will be delivered onto the conveyor chain. Thereupon, the continuous delivery of the cartridges to the link belt loading device 18 will be interrupted whereby a break in the belt occurs after each link belt of two hundred and sixty-five cartridges has been formed.

What is claimed is:

1. A machine for selectively arranging a plurality of dissimilar articles in predetermined sequence comprising a frame; a track on said frame; an article conveying means movable on said track, said movable conveying means comprising a pair of endless spaced parallel roller link chains guided by said tracks and rods connecting opposite links of the respective chains, said rods being spaced apart longitudinally to provide apertures for receiving said articles with corresponding ends of the rods extending laterally beyond one of the chains; a plurality of arcuate chutes for feeding dissimilar articles by gravity into the apertures of the endless chain conveyor; flanges on the lower ends of said chutes; fastening means for securing said flanges to said frame; a gate pivotally mounted on said frame adjacent the lower end of each chute, each gate comprising a pair of laterally spaced fingers adapted to engage an article in the respective chute to prevent the release of an article from the chute and a trigger to actuate the fingers to enable the release of an article from the chute; and article selecting members comprising disks secured on the extended ends of said rods, each disk being arranged so as to engage the trigger of one of the gates to actuate the article retaining fingers thereof and release an article so selected from the respective chute into an aperture of the endless chain conveyor.

2. A machine for selectively arranging a plurality of dissimilar types of cartridges in predetermined sequence comprising a longitudinal substantially horizontal frame; a bed on said frame; a pair of tracks mounted adjacent said bed; an endless conveyor belt movable on said track, said belt comprising a pair of roller link chains slidable on said tracks and rods connecting opposite links of the respective chains, said rods being parallel and spaced apart longitudinally to provide apertures for accommodating said cartridges with corresponding ends of the rods extending laterally beyond one of the chains; a plurality of chutes for feeding cartridges by gravity into the apertures of the endless conveyor belt onto the bed of said frame, each chute being adapted to hold one type of the several dissimilar types of cartridges to be fed to the conveyor belt; flanges on the lower end of each chute; fastening means for securing the flanges to the frame at longitudinally spaced points thereon; gates pivotally mounted on said frame adjacent the lower end of each chute, each gate comprising a pair of laterally spaced fingers adapted to be held in engagement with the cartridge in the respective chute to prevent the release of the cartridge therefrom and a trigger to actuate the finger to enable the release of a cartridge from the chute; a disk secured on the extended end of each rod, said disks being at various distances from the ends of the rods, each disk being adapted to engage the trigger of one of the gates to actuate the fingers thereof and release a cartridge so selected from the respective chute into an aperture of the endless chain conveyor; and means for moving said conveyor belt to successively engage said disks with the fingers of said gates.

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