Aug. 30, 1932. A. J. WAGNER 1,874,669

CASE FILLING MACHINE

Filed March 19, 1929 4 Sheets-Sheet 1

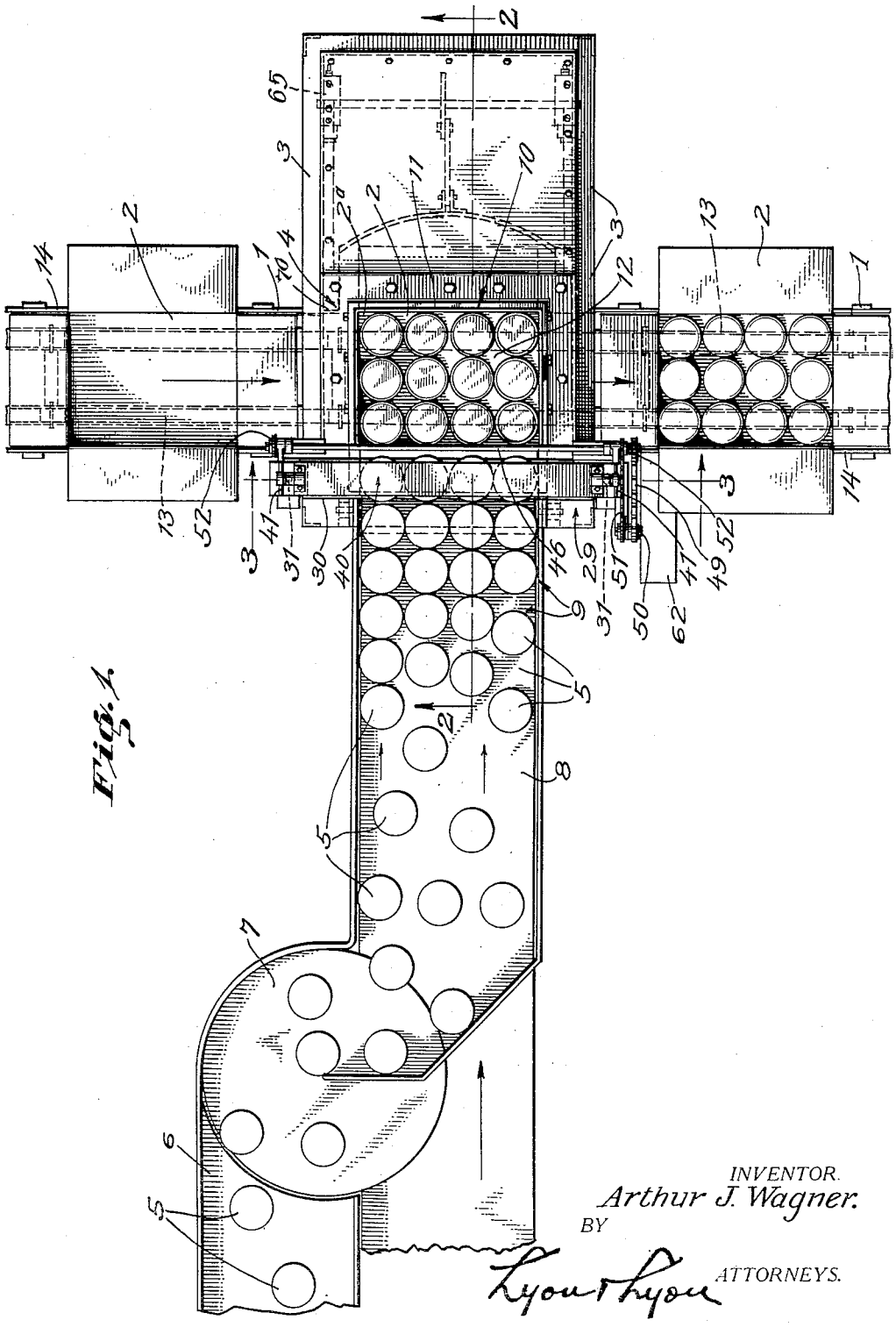


Fig. 1.

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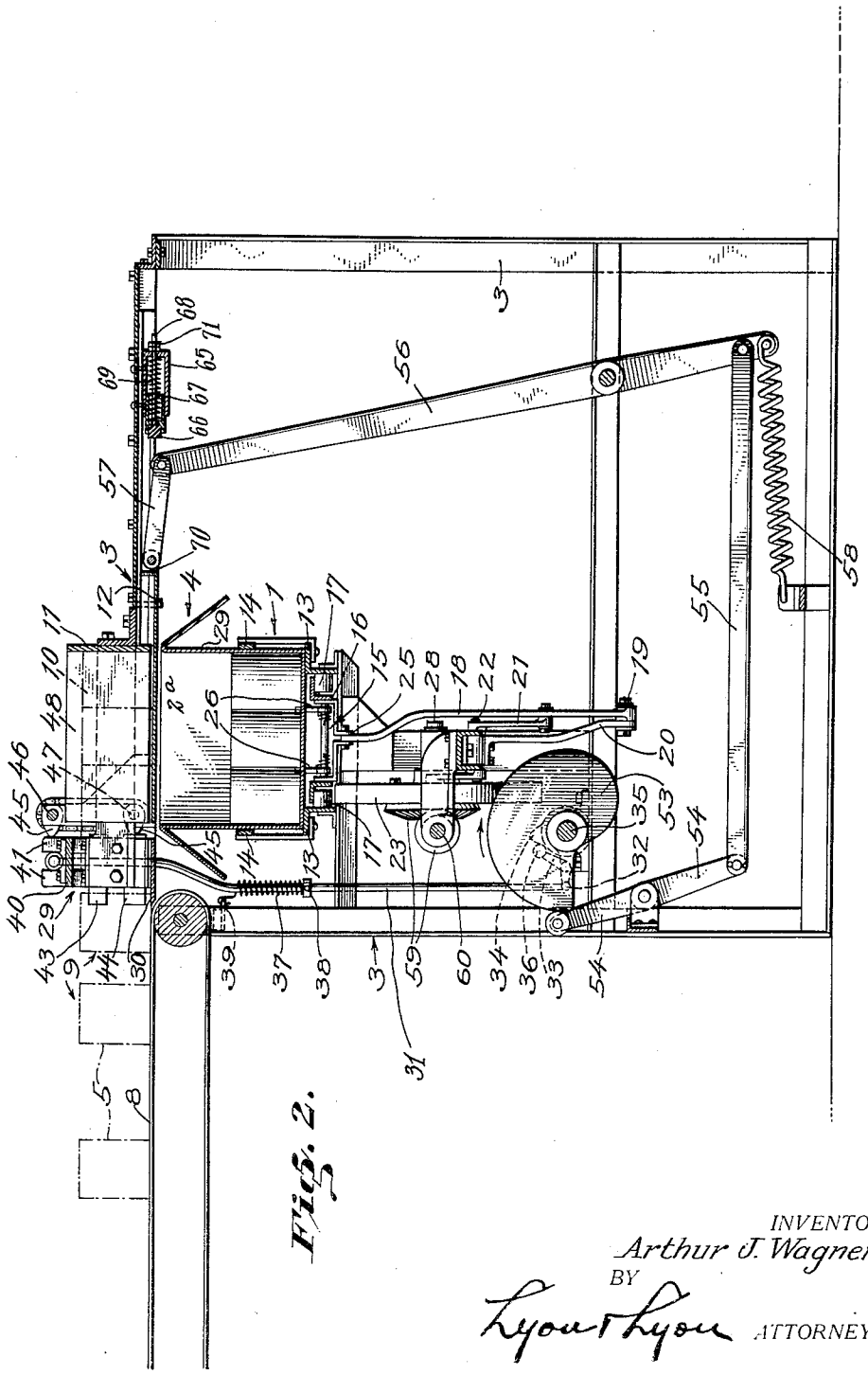


Fig. 2.

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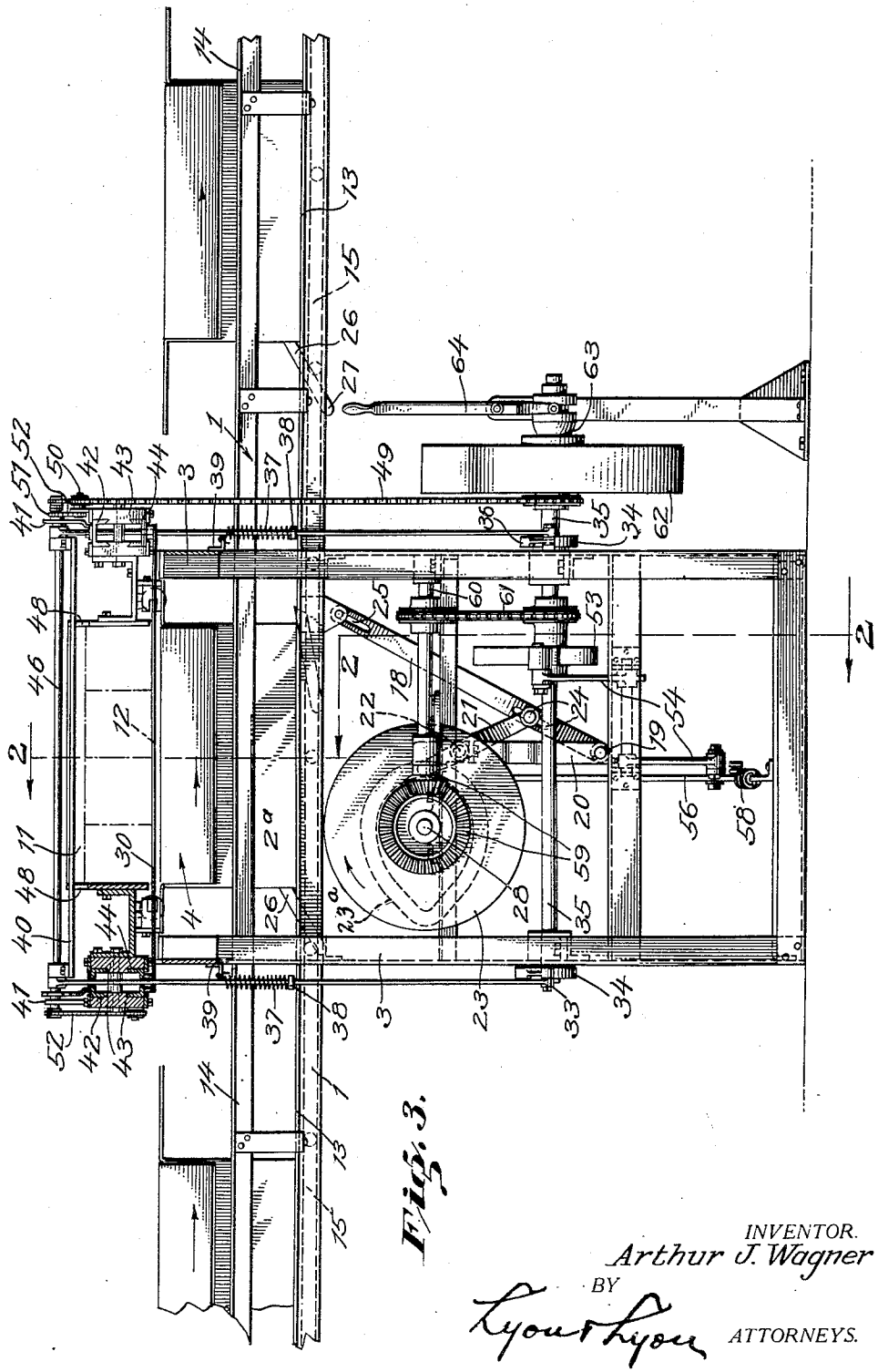


Fig. 3.

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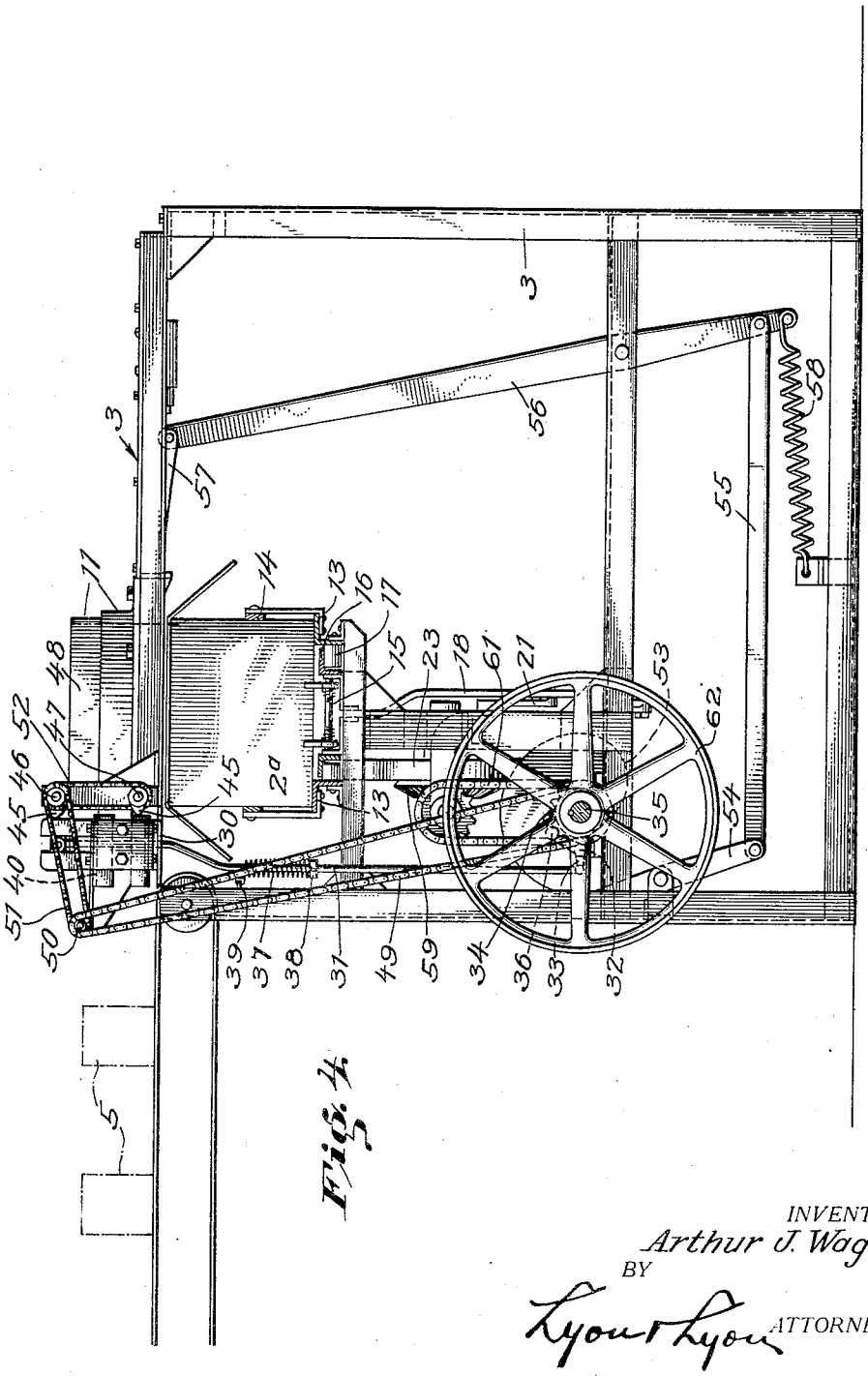


Fig. 4.

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UNITED STATES PATENT OFFICE

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CASE-FILLING MACHINE

Application filed March 19, 1929. Serial No. 348,150.

This invention relates to a machine for filling packing cases, and is particularly adapted to fill such cases with articles of uniform shape and size, for example, canned goods.

The general object of the invention is to provide simple means for rapidly filling cases with articles, for example, canned goods.

A further object of the invention is to provide a machine of this kind which will operate effectively to advance articles in groups sufficient to cover the entire area of the packing case and whereby the entire area of the packing case can be filled by the group of articles moving down or into the case; and also to provide means for filling the packing case tier by tier, each tier of articles covering the entire area of the case.

In its preferred embodiment, the invention includes a bottom plate or support located over the case to be filled, and includes means for advancing a group of articles onto this bottom plate.

One of the objects of the invention is to provide simple means for feeding forward the articles onto this bottom plate and for arresting the advance of the articles coming onto the bottom plate when the bottom plate is withdrawn to permit the group of articles to move into the packing case.

Further objects of the invention will appear hereinafter.

The invention consists in the novel parts and combinations of parts to be described hereinafter all of which contribute to produce an efficient case-filling machine.

A preferred embodiment of the invention is described in the following specification, while the broad scope of the invention is pointed out in the appended claims.

In the drawings:

Figure 1 is a plan of a case-filling machine embodying my invention.

Figure 2 is a vertical section through the machine taken about on the line 2—2 of Figures 1 and 3.

Figure 3 is a vertical section through the machine taken about on the line 3—3 of Figure 1.

Figure 4 is a side elevation of the machine showing the guideway for the packing cases in cross section.

The general mode of operation of the machine will be readily perceived by referring to Figure 1. In its general construction the machine is provided with means for holding a packing case in its receiving position. To this end I prefer to provide a transverse guideway 1 along which the packing cases are advanced automatically in the direction of the arrow by mechanism which will be described hereinafter. This mechanism moves the packing cases 2 past the main frame 3 of the machine and holds them stationary for a short period of time at the filling position 4.

The articles to be supplied to the filling cases, for example, cans 5, are fed by a chute 6 to a feed wheel 7 that passes the articles onto a carrier 8, preferably in the form of an endless belt. The carrier 8 cooperates with other mechanism to advance the articles in rows or phalanxes 9 which move forwardly in mass formation, as it were, so as to bring a group 10, consisting of any number of the articles (for example, 12) over the case. In order to accomplish this the feed belt 8 cooperates with a back stop 11 against which the phalanxes of the articles are pushed. After the group 10 of the articles are positioned in this way, a bottom plate 12, preferably in the form of a slide (see Fig. 2), is withdrawn so as to permit the group of articles to descend into the case 2^a that is located in its receiving position.

Just at the time the slide 12 is withdrawn the articles 9 that are following the group 10 are detained by detaining means which prevents their advance, and this detaining means preferably is mounted so as to give a slight backward movement to the articles and separate them from the group to facilitate the passage of the group into the case being filled

In order to bring the filling cases 2 in position successively below the bottom plate 12, the guideway 1 is constructed in the form of a track with two parallel side-rails 13, which may be in the form of angle-iron with horizontal flanges uppermost.

On these flanges the packing cases rest. Upper side-rails 14 may be provided for engaging the side-walls of the packing cases.

In order to feed the filling cases periodically forward, I provide a reciprocating carriage 15 comprising side bars 16 in the form of angle irons with horizontal flanges supported on rollers 17 carried by the rails of the guideways. This carriage 15 is reciprocated periodically by a long lever 18 that extends up from the lower part of the main frame of the machine, being supported on a pivot bolt 19 secured in the lower end of a fixed bracket 20. This lever 18 is actuated by a lever 21 (see Fig. 3) having its fulcrum on a fixed shaft 22, and having a short arm 22^a provided with a roller running in a cam slot 23^a in a cam 23. The lever 21 has a pin-and-slot connection 24 with the long lever and the upper end of the long lever 18 has a pin-and-slot connection 25 with the carriage. The carriage is provided with a plurality of one-way dogs or pushers 26. These dogs are pivoted on the carriage and rock in a clockwise direction when the carriage moves toward the left, as viewed in Figure 3, but they bob up into position behind the packing cases so as to advance the same. In other words, each dog 26 has a counterbalancing tail 27 that brings the dog up into operative position after it is passed rearwardly beyond the rear wall of the packing case which it is to advance.

The cam 23 is mounted on a cam shaft 28.

Referring to Figure 2, as the feeding means for the articles moves them onto the bottom plate, they pass by detaining means 29, said detaining means preferably including a bridge plate 30 located between the end of the slide 12 and the end of the belt 8, this bridge bar or plate 30 is flush with the end of the slide 12 and facilitates the passage of the articles from the belt onto the bottom plate. The bridge plate is provided with means for automatically detaining the articles that are following the group 10 that has been moved onto the bottom plate, and is also preferably provided with means for oscillating it away from the bottom plate 12 so as to produce a gap or separation between the advanced group 10 and the other articles at the time that the slide 12 is withdrawn to permit the group 10 to descend into the case.

The construction for this purpose preferably includes two long rocker arms 31 supported on pivot pins 32 on bell crank levers 33 actuated by cams 34 on the main shaft 35 of the machine. The rollers 36 of these rockers 33 are held on their cams by coil springs 37 disposed around the arms 31 and attached to collars 38 respectively on the arms 31, and attached at their upper ends to anchors 39 on the frame of the machine. This enables the cams 34 to operate periodically to cause the arms 31 to move down, thereby actuating detaining means to hold the articles that are located on the bridge plate.

For this purpose I provide a clamping bar or cross-head 40 located above the bridge plate 30, the ends of this cross-head being guided in a suitable guide 41 at each side of the machine. These guides 41 are carried on saddle-shaped slides 42 (see Fig. 3) guided to slide in guide-plates 43, which are secured to the frame of the machine. The bridge plate 30 is attached at its ends to similar saddle plates 44 disposed in inverted position (see Fig. 3), but also guided in the guide-plates 43. The rocker arms 31 pass up loosely through openings through these slides 42 and 44 (see Fig. 3). With this organization of parts it will be evident that the bridge plate 30 and the clamping plate 40, together with the saddle-plates 42 and 44, can oscillate toward and from the edge of the slide 12. At the time that the slide 12 is withdrawn to permit the group 10 of articles to descend into the filling case, the cams 34 will operate to pull down on the rocker arms 31 and thereby move down the cross-head 40 so as to clamp the foremost row or phalanx of the advancing cans so as to hold them on the bridge plate. When this occurs automatic means rocks or oscillates the bridge plate and clamping bar 40 away from the slide 12. Any suitable means may be employed for this purpose but in the present instance I provide cam means including two sets of cams 45 the noses of which engage the saddle plates 42 and 44 so as to slide the same toward the left as viewed in Figure 2.

The upper pair of cams 45 are carried on a transverse cam shaft 46. The lower cams are carried on stub shafts 47 located at each side of the side-plates 48 that cooperate with the back stop 11 to form a pen for the group 10 of cans that are advanced onto the bottom plate 12. The cams are all actuated continuously by a sprocket chain 49 (see Fig. 4) that is driven from the main shaft of the machine. This sprocket chain extends upwardly in an inclined direction (see Fig. 4) to remove it from the path of the filling cases, and its upper end operates a countershaft 50 from which a sprocket chain 51 extends over to drive the cam shaft 46. The cam shaft 46 drives the lower cams through vertical sprocket chains 52 (see Fig. 4).

In the operation the cams 45 are so timed that they will oscillate the bridge plate 30 and its connected parts away from the slide 12 just before the slide 12 is withdrawn. This prevents any possibility of the advancing cans interfering with the deposit of the group 10 in the filling cases.

Any suitable means may be provided for actuating the slide 12 at the proper moment. In the present instance this is accomplished by means of a large cam 53 (see Fig. 2) on

main shaft 35 that operates a cam lever 54 connecting to link 55 and operating a long lever 56 that extends up to the upper part of the frame and is connected by link 57 with the end of the slide plate 12 opposite to the bridge plate 30.

A spring 58 holds the roller of the cam lever 54 up against the cam and withdraws the slide 12 when permitted to do so by the cam 53.

The cam shaft 28 is driven through beveled gearing 59 (see Fig. 3) driven by a countershaft 60 parallel to the main shaft 35 and driven by sprocket chain 61 from the main shaft. The main shaft may carry a fly wheel 62 and may be driven at will through a clutch 63 controlled by a clutch lever 64.

I will now briefly describe the general mode of operation of the machine.

Referring to Figure 1, the articles such as cans 5 are fed forwardly from the wheel 7 onto endless conveyor or carrier 8 which operates as yielding means for pushing the cans forward across the bridge plate 30 and onto the slide 12 where the cans are stopped by the back plate 11. In this way a group 10, for example 12 cans, are advanced into position over the case 2^a which is being temporarily held in its filling position under the bottom plate 12. After the group 10 of cans are positioned in this way above the case 2^a, the cams 34 operate to pull down on the rocker arms 31, thereby moving down the crosshead 40 onto the row of cans that are on the bridge plate, thereby clamping the same and detaining the cans that are advancing on the endless conveyor 8.

As soon as the cans on the bridge plate 30 are clamped in this manner the cams 45 operate to oscillate the bridge plate 30 and its cooperating parts so as to move its edge away from contact with the edge of the slide 12, thereby opening up a gap between the advancing cans and the group that is already on the slide 12. When the bridge plate is oscillated away from the slide in this way, the slide 12 is automatically withdrawn by the lever 56 operated by its cam 53. The cam is so shaped that this movement of the slide is quite sudden, enabling the cans in the group 10 to fall as a body into the filling case.

Figure 2 shows the filling case 2^a with 12 cans in it, being ready to receive a second group of cans which would completely fill the case and provide a case filled with two dozen cans.

In order to avoid shock in the mechanism when the spring 58 withdraws the bottom plate 12, I provide two buffer cylinders 65 (see Fig. 2). These cylinders are located each side of the machine and near the guide ways for the ends of the plate 12 (see Fig. 1). Those buffer cylinders may be of any suitable construction. As illustrated, each cylinder is bolted in place from above and is provided with a head 66 of soft material and set in a plunger 67 that slides in the barrel of the cylinder 65, being provided with a guide stem 68 surrounded by a coil spring 69. These coil springs are compressed when the soft head 66 is struck by the ends 70 of the plate 12 (see Fig. 1).

The stem 68 is provided with check nuts 71 that limit the forward movement of the plunger 67 under the action of the spring 69.

It is understood that the embodiment of the invention described herein is only one of the many embodiments this invention may take, and I do not wish to be limited in the practice of the invention, nor in the claims, to the particular embodiment set forth.

What I claim is:

1. In a machine for placing articles in packing cases, the combination of a frame, means for feeding the packing cases in a path past the frame, an endless belt conveyor for advancing the articles along a path above, and transverse to, the first-named path, a stop located beyond the path of the packing cases for arresting the advance of all the articles and cooperating with the conveyor to position a group of the articles over a packing case, removable means for supporting the said group of articles, with means for moving the same to permit the group of articles to descend into the packing case, means for detaining the foremost articles following said group to hold the same while the said group of articles are descending into the case, and means for rocking the holding means away from the said group to separate the held articles from the group.

2. In a machine for placing articles in packing cases, the combination of a frame, means for holding a packing case in its receiving position, a bottom plate over the position of the case and a back stop beyond the case, means for yieldingly advancing the articles across the bottom plate and cooperating with the back stop to position a group of the articles over the case, detaining means for arresting the advance of the articles following the said group, means for withdrawing the bottom plate to permit the group of articles to descend into the case, means for supporting the detaining means to enable the same to move away from the bottom plate, with means for moving the same away from the bottom plate before the bottom plate is actuated to permit the group of articles to descend into the case.

3. In a machine for placing articles in packing cases, the combination of a frame, means for holding the packing case in its receiving position, a bottom plate located above the position of the case with a back stop beyond the case, an endless belt conveyor for advancing the articles onto the bottom plate and cooperating with the back stop to position a group of the articles on the bottom plate above

the case, means for detaining the articles following the said group, and means for withdrawing the bottom plate to permit the articles in the group to descend into the case, said detaining means including a bridge plate between the end of the conveyor belt and the bottom plate across which the articles pass, and means for supporting the same to oscillate toward and from the bottom plate, and automatic means for oscillating the detaining means away from the bottom plate before the same is withdrawn.

4. In a machine for placing articles in packing cases, the combination of a frame, means for supporting the case in its receiving position, a bottom plate in the form of a slide disposed over the position of the case, a back-stop beyond the case, an endless belt conveyor for advancing the articles onto the bottom plate and cooperating with the back-stop to position a group of the articles on the slide above the case, a bridge-plate located between the end of the belt conveyor and the slide, rocker arms cooperating with the bridge plate to enable the same to oscillate toward and from the slide, means associated with the bridge plate for detaining the articles on the bridge plate and thereby hold back the articles on the belt conveyor, cam means for rocking the bridge plate away from the group of articles on the slide, and means for withdrawing the slide to permit the group of articles to descend into the case.

5. In a machine for placing articles in packing cases, the combination of a frame, means for supporting the case in its receiving position, a bottom plate in the form of a slide disposed over the position of the case, a back-stop beyond the case, an endless belt conveyor for advancing the articles onto the bottom plate and cooperating with the back-stop to position a group of the articles on the slide above the case, a bridge-plate located between the end of the belt conveyor and the slide, rocker arms cooperating with the bridge plate to enable the same to oscillate toward and from the slide, means associated with the bridge plate for detaining the articles on the bridge plate and thereby hold back the articles on the belt conveyor, cam means for rocking the bridge plate away from the group of articles on the slide, and means for withdrawing the slide to permit the group of articles to descend into the case, said detaining means having a clamping bar with automatic means for operating the same to clamp the articles on the bridge-plate.

6. In a machine for placing articles in packing cases, the combination of a frame, means for holding the packing case in its receiving position, a bottom plate in the form of a slide located over the position of the filling case, a back-stop located beyond the filling case, an endless belt conveyor for advancing the articles onto the bottom plate and cooperating with the back-stop to position a group of articles above the case, a cam shaft and cam below the conveyor belt, a pair of pivotally supported arms, a bridge-plate located between the bottom plate and the belt, across which the articles pass, and cooperating with the said arms to oscillate toward and from the bottom plate, a clamping-bar operated by the cam and connected to the said bars for clamping the foremost advancing articles on the bridge bar, means for oscillating the bridge-plate away from the bottom plate to separate the held articles from the said group of articles, and means for withdrawing the bottom plate to permit the group of articles to descend into the case.

Signed at Kahului, Maui, Hawaii.

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