

June 16, 1931.

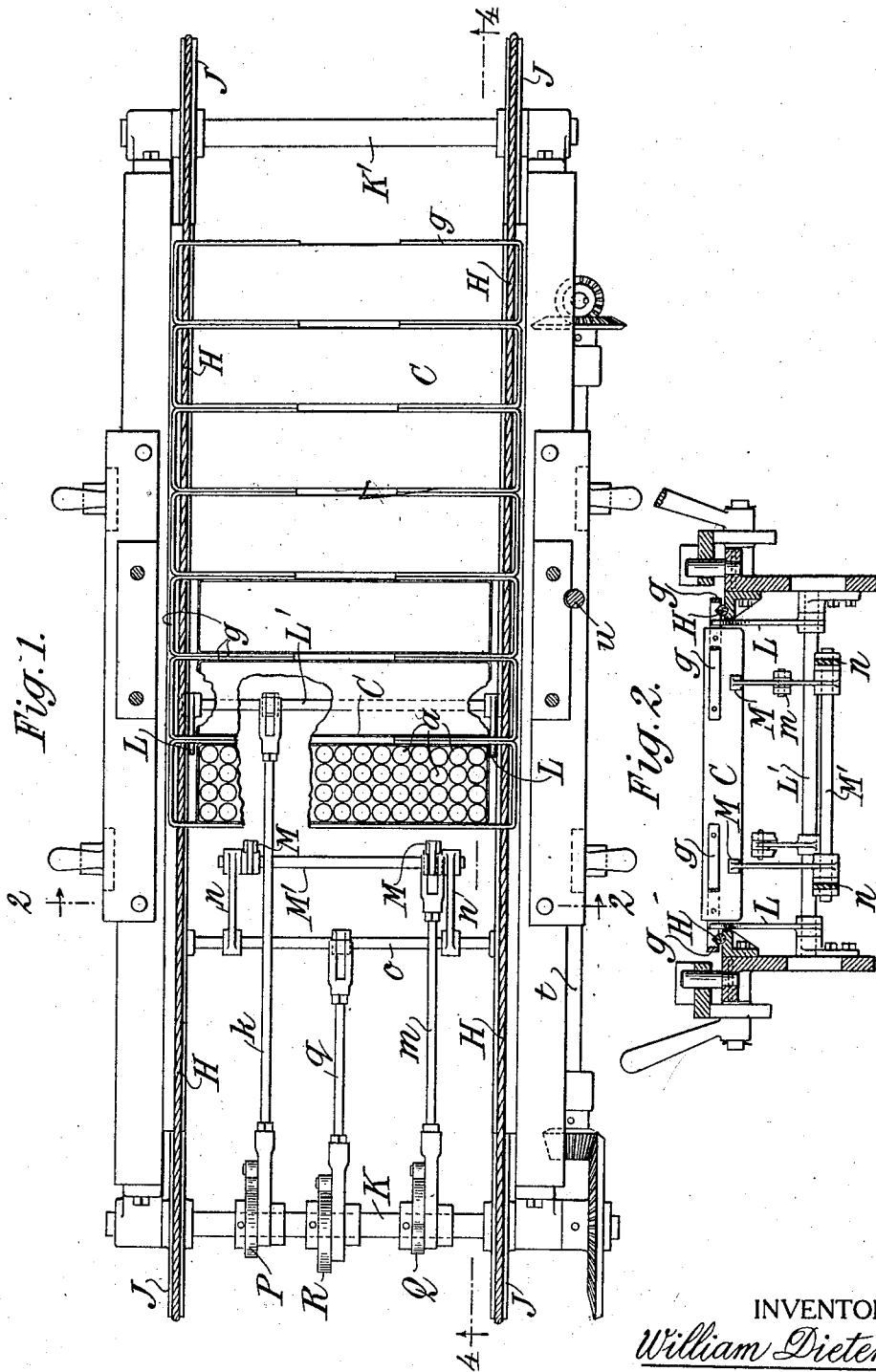
W. DIETER

1,810,645

INTERMITTENT FEED MECHANISM

Filed Oct. 15, 1927

3 Sheets-Sheet 1



INVENTOR :

*William Dieter,*

By Attorneys,

*Draper, Myers & Manly,*

June 16, 1931.

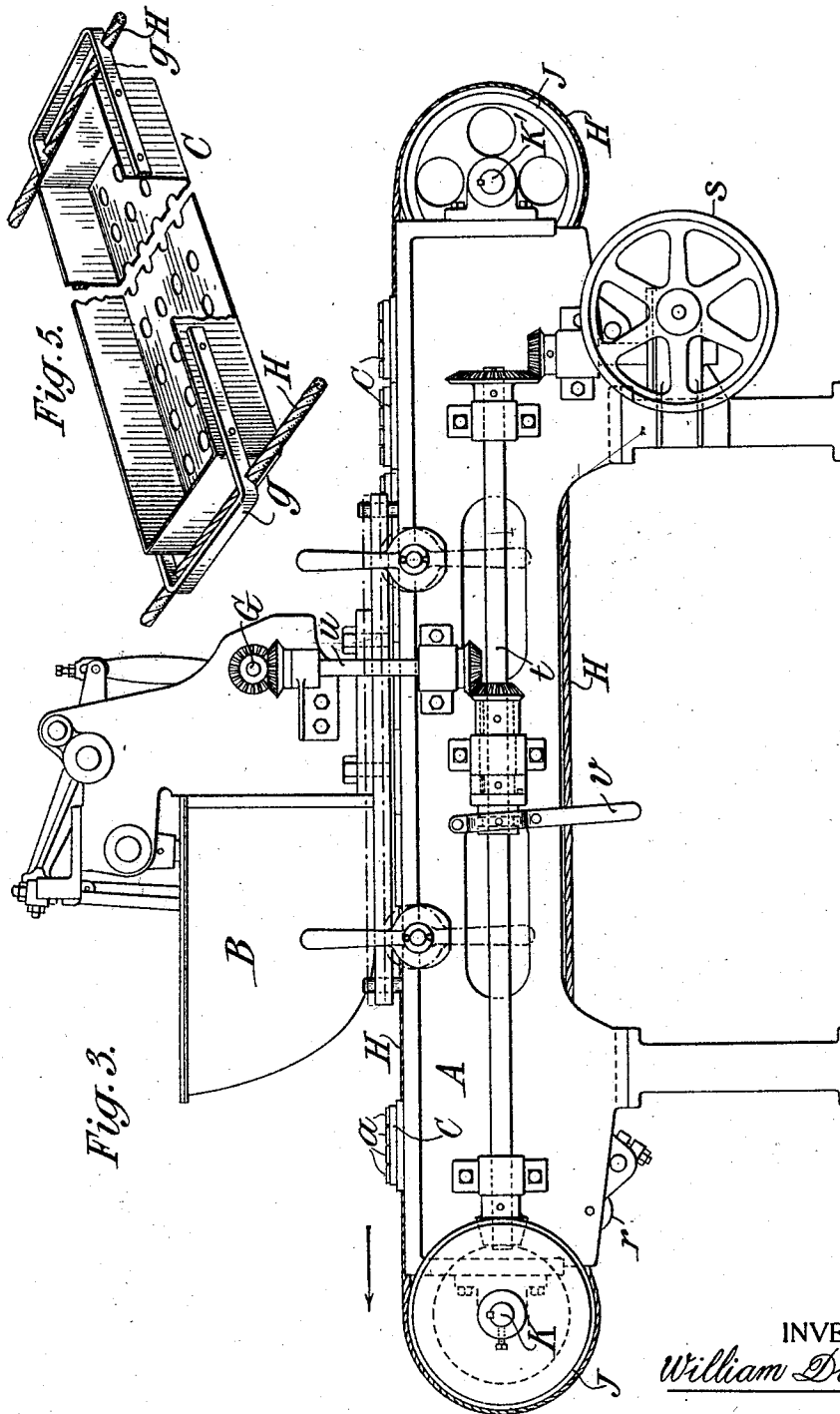
W. DIETER

1,810,645

INTERMITTENT FEED MECHANISM

Filed Oct. 15, 1927

3 Sheets-Sheet 2



INVENTOR :

William Dieter,

By Attorneys,

Draser, Myers & Manly,

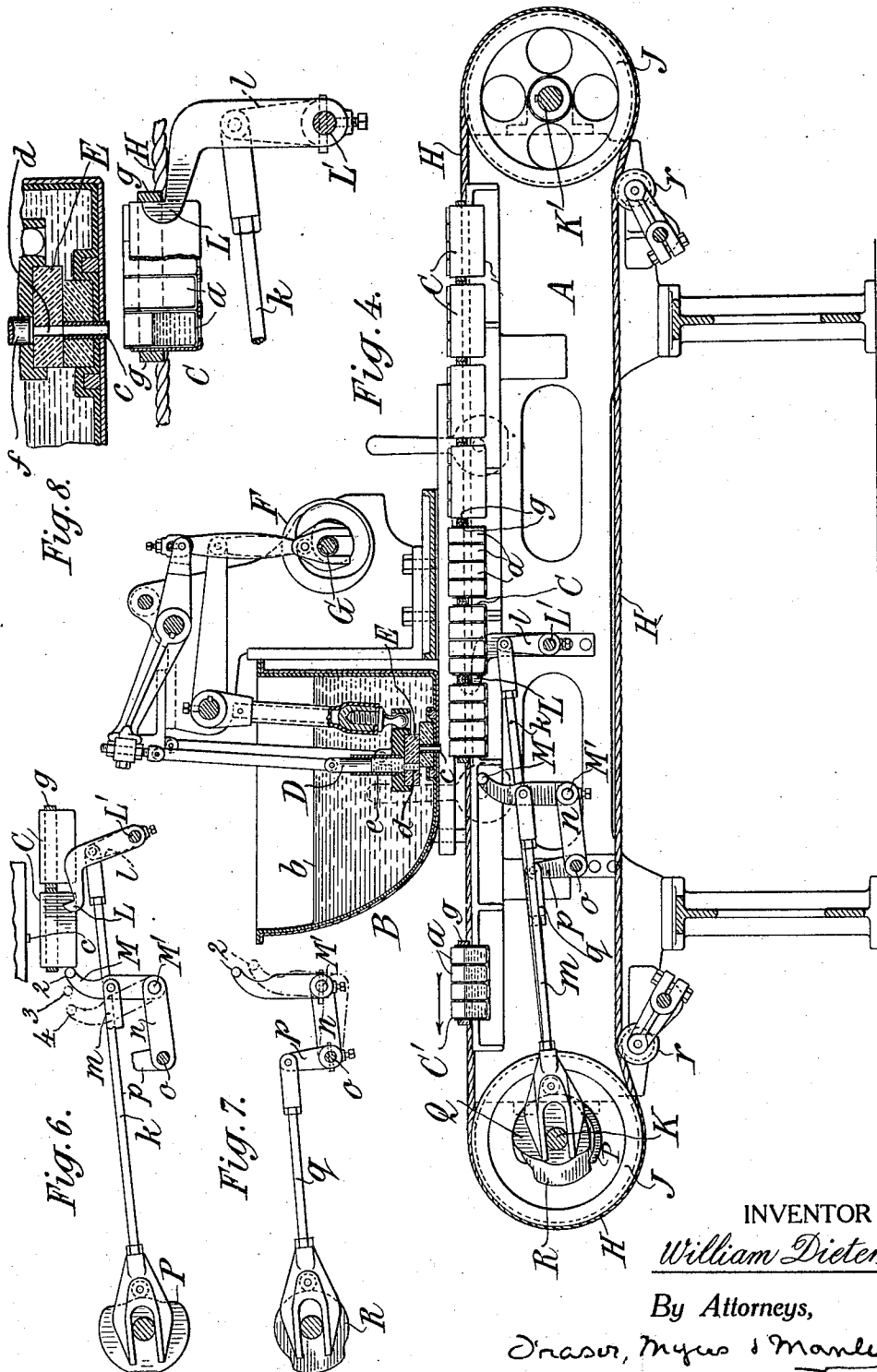
**June 16, 1931.**

W. DIETER

**1,810,645**

## INTERMITTENT FEED MECHANISM

Filed Oct. 15, 1927 3 Sheets-Sheet 3



## UNITED STATES PATENT OFFICE

WILLIAM DIETER, OF NEWARK, NEW JERSEY, ASSIGNOR TO E. W. BLISS COMPANY, OF  
BROOKLYN, NEW YORK, A CORPORATION OF DELAWARE

## INTERMITTENT FEED MECHANISM

Application filed October 15, 1927. Serial No. 226,416.

This invention provides a feed motion for giving an intermittent feed to objects entering or passing through various kinds of machines, such as machines for filling receptacles, punching machines and various types of intermittently operating presses.

The particular use for which the new feed motion was designed is for feeding receptacles in a filling machine which charges them uniformly with a material. The particular machines shown is for charging electrolyte into zinc cups of small primary batteries, although useful for filling any fluid substance into any kind of receptacles.

In the accompanying drawings which illustrate a machine of this character for which my invention is applied,

Figure 1 is a plan of the machine partly broken away.

Fig. 2 is a transverse section on the line 2-2 of Fig. 1.

Fig. 3 is a side elevation.

Fig. 4 is a longitudinal section.

Fig. 5 is a perspective showing one of the series of trays.

Fig. 6 is a view showing certain of the parts in Fig. 4 in different positions.

Fig. 7 is a similar view showing other parts.

Fig. 8 is a fragmentary view, being an enlargement of Fig. 4 with the parts in a different position.

To enable the new feed motion of my invention to be better understood I will first describe the filling machine, which forms no part of my invention.

Mounted on a main frame A is a tank B beneath which are moved trays C, C (one of which is shown in Fig. 5) containing receptacles or cups *a*, *a* to be filled with the liquid *b* contained in the tank B. With the proportions shown, the trays carry each a succession of rows of the receptacles *a*, *a*. In the bottom of the tank B is a row of filling spouts *c* passing through the bottom of the tank so that when any one row of receptacles is beneath these spouts the material may be discharged through the spouts into the receptacles. In operation, with one row of receptacles beneath the spouts, these receptacles are

filled; then the tray is advanced to bring the next row of receptacles beneath the spouts, and these in turn are filled; and so on until all the receptacles are filled. The means for discharging the material through the spouts forms no part of this invention, but in the construction best shown in Figs. 4 and 8 it comprises a series of pumps D and a slide E having through it a series of ports *d*. Each pump has a cylinder or pump chamber *e* above the port *d* and a plunger *f* moving in this cylinder. The parts *d*, *e*, *f* correspond in number and arrangement with the spouts *c*. In operation, when the slide E is displaced, as shown in Fig. 4, the plunger *f* is lifted, thereby sucking liquid up through the ports *d* into the pump chambers; the slide is then moved to the position shown in Fig. 8, when the plungers descend, forcing the material from the pump chambers down through the spouts *c* into the receptacles. These movements are imparted by a suitable arrangement of connecting rods and levers whereby motion is taken from cams F on a shaft G (Fig. 4). This mechanism is obvious from the drawings, and as it forms no part of my invention requires no description.

Those parts of the machine which involve the embodiment of my invention will now be described.

An endless conveyor H is carried over pulleys J, J on shafts K, K' having bearings at opposite ends of the main frame A. Any suitable sort of endless conveyor may be provided, such a belt, cord, rope or chain. A conveyor consisting of two ropes (preferably wire ropes) is shown. By means of power suitably applied, this conveyor is driven continuously at a sufficient speed. The function of the conveyor is to propel the receptacles under the spouts of the filling mechanism. In the case of small receptacles these are best assembled in carriers of any suitable kind, such, for example as the trays C already described. In such case the receptacles are propelled by the conveyor through the intermediation of the trays. For this purpose the trays have a frictional engagement with the conveyor members or ropes. This connection may be that shown in Fig. 5 wherein each tray

has end frames  $g$ ,  $g$  which project beyond its ends and rest upon the ropes. They are preferably formed with notches engaging the ropes, as shown in Fig. 5. Thus the weight of the trays and their contents affords a frictional engagement whereby the conveyor acts to propel the trays at a suitable speed whenever they are free to travel.

The feed mechanism performs the function of holding the trays and their contained receptacles stationary during the filling periods and then releasing them so that they may be carried along by the conveyor while the pumps are recharging with material preparatory to the next filling period. This result is accomplished by stop devices which are encountered by the trays and whereby they are held stationary at the required intervals and then released and permitted to move forward for the necessary distance to bring the next row of receptacles under the filling spouts; and so on so long as the receptacles are required to be filled. The stops are so located as to accomplish this result and are operated synchronously with the filling mechanism.

While the stop mechanism is subject to some variation according to conditions, I will describe the particular construction shown as the preferred example embodying my invention.

The stop mechanism comprises two stops  $L$  and  $M$ ; the stop  $L$  engages the frames  $g$  of the trays; the stop  $m$  engages the free or advancing face of the trays. With trays having end frames  $g$ , as shown in Fig. 5, and which trays are of considerable length, it is best to provide two stops  $L$ ,  $L$ , as shown in Figs. 1 and 2, so located as to engage the frames  $g$  beyond the ends of the trays. These stops are formed on lever arms projecting from a shaft  $L'$  which has an arm  $l$  connected by a rod  $k$  to a cam  $P$  on the shaft  $K$ , this connection being as shown in Fig. 6. The cam gives to the stop  $L$  a swinging movement from the position shown in Figs. 4 and 8 to that shown in Fig. 6.

The stop  $M$  is also preferably duplicated because of the use of long trays  $C$  so that the two stops abut the trays near their opposite ends, as shown in Figs. 1 and 2. The stops  $M$  are movable to different positions in the line of travel of the trays, these positions being separated by a distance equal to the separation of the rows of the receptacles. In Fig. 6 three positions marked 2, 3 and 4 are shown. The stops are on arms fixed on a floating shaft  $M'$ , and one of them is connected by a link  $m$  to a cam  $Q$  on the shaft  $K$ . The floating shaft  $M'$  is carried on arms  $n$ ,  $n$  on a rock shaft  $o$  having an arm  $p$  connected by a rod  $q$  to a cam  $R$  (Fig. 7) also on the shaft  $K$ . The function of the mechanism shown in Fig. 7 is to give a descending movement to the stops  $M$ ,  $M$  so as to bring them be-

neath the trays and thereby permit the tray having filled receptacles to be rapidly fed away by the carrier  $H$ , as shown at  $C'$  in Fig. 4, to any suitable point of delivery where the tray may be lifted out.

The operation will now be described with reference to the particular proportions illustrated in the drawings, that is to say, for trays  $C$  carrying each four rows of receptacles  $a$  so that each tray requires to be advanced first to the position for filling the first row of receptacles; second, to a position for filling the second row; third to a position for filling the third row; fourth, to a position for filling the fourth row; and then to be released so that the tray may be carried forward freely to the position  $C'$ . The function of the stop  $L$  is to arrest each of the successive trays in the position for filling its first row of receptacles, this being the position shown in Figs. 4 and 8. At this time the stops  $M$  are in their most advanced position, that is closest to the tray and separated from it by a distance equal to the outer diameter of the individual receptacles. At the end of the operation of filling the first row of receptacles, the stops  $L$  swing forward to the position shown in Fig. 6, thereby releasing the frames  $g$  and permitting the traction of the traveling conveyor  $H$  to propel the tray (and equally all following trays) forward one space until arrested by the stationary stops  $M$ . This completes the first feed, and the tray now remains stationary while the second row of receptacles is being filled. Thereupon, the stops  $M$  execute a retrograde movement (that is, in the direction of travel of the conveyor) from the position 2 in Fig. 6 to the position 3; this brings the third row of receptacles under the spouts  $a$ , so that these receptacles are then filled. Thereupon the stops  $M$  execute a second retrograde movement to the position 4, which permits the tray to advance until the fourth row of receptacles is under the spouts  $a$ . Meanwhile (and at any time after the frames  $g$  of the first and second trays have passed over them) the stops  $L$  have swung back to the position shown in Fig. 8; during this movement the stops rise within the clear space beyond the ends of the second tray and between the front and rear sides of its frames  $g$ , going into position to encounter the rear sides of these frames when the first row of receptacles in the next tray is in the filling position. When the fourth row of receptacles in the first tray has been filled, this tray is released by the dropping of the stops  $M$  to the lower position shown in dotted lines in Fig. 7, whereby the stops are brought beneath the tray and the latter is thereby set free and is carried rapidly to the position  $C'$ . This latter movement is accompanied by a corresponding advance of the next following or second tray, but only so far as to bring its frame  $g$  against the stops  $L$ .

This brings the second tray to the starting position of the first tray, and the operation from that point is simply a repetition of that already described.

5 The purpose of providing two stops L and M operating somewhat alternately is to accomplish a variable feed which is required by the use of the successive trays C with their arms *g*. This occasions a gap between  
10 the fourth row of receptacles in the first tray and the first row of receptacles in the next or second tray, which gap represents an idle space which must be bridged by a more ample feed movement between the fourth and  
15 the first filling positions. By locating the stops L so as to arrest each tray in the position for filling the first row of receptacles and causing the stops M to control the filling positions for the second, third and fourth  
20 rows, the jump feed required between the fourth and first rows is readily and accurately provided for.

With trays holding four rows of receptacles, the shaft G operating the filling mechanism makes four revolutions to one revolution of the shaft K which operates the feeding mechanism. This proportion must be altered for every different proportion and arrangement of receptacles.

30 It is preferable to make the pulleys J of such diameter as to impart to the conveyor H a rate of travel considerably more rapid than the rate of feed between the rows of receptacles; a rate of travel from five to seven  
35 times the rate of feed is found suitable, but may be varied as desired. To keep the upper side of the conveyor ropes H taut, it is desirable to use tension rollers *r, r* pressed upward by any suitable means.

40 The machine is shown as propelled from a belt pulley *s* having geared connection to a longitudinal shaft *t* and thence through a vertical shaft *u* for driving the shaft G through miter gears, the same shaft *t* carrying a bevel pinion for driving a bevel gear  
45 on the shaft K. A clutch lever *v* may operate any suitable clutch for stopping the drive when desired.

It will be obvious that the feed stop mechanism of my invention may be greatly varied. Each different size and proportion of receptacles to be filled and of trays for carrying such receptacles requires specially proportioned driving means. While it is preferred that the stops L control the initial positioning of the receptacles and that the subsequent positioning be determined by successive positions of the stops M,—yet the work of stopping the feed movements in the successive filling positions may be otherwise divided between the respective stops. Thus,  
50 one stop might locate the receptacles in their first and second filling positions, and the other in their third and fourth filling positions (in the case of four successive filling  
55 positions)

or any other practicable arrangement for positioning the parts in their required successive locations may be adopted; these matters of proportions and detail being within the skill of the mechanic or engineer. 70

Consequently, it is to be understood that the apparatus herein shown and described, while being at present the preferred embodiment of the invention, is subject to variation within the scope of the appended claims. 75

What I claim is:

1. A feed mechanism applicable to control the movement of a series of objects having a tendency to forward movement, comprising two stops, the one adapted to initially stop the foremost object and to release it, and the other adapted to stop said object in a second stopping position, and one of said stops movable to another position to arrest the object at a third stopping position. 80

2. A feed mechanism according to claim 1, one of the stops movable in the direction of travel of the objects between successive stopping positions thereof. 85

3. A feed mechanism according to claim 1, one stop movable into and out of the path of movement of the objects, and the other movable in the direction of their travel and also out of their path of travel. 90

4. A feed mechanism according to claim 1, one of the stops movable into and out of the path of travel of the object, and the other movable in the direction of their travel to a plurality of successive stopping positions, and movable also out of their path of travel. 95

5. A feed mechanism comprising means for engaging a series of objects to be fed to impart to them a tendency to travel in a direction of feed, and stops adapted to arrest the foremost object and thereby hold back the following objects, one stop adapted to initially arrest the foremost object in a stopping position, and the other stop adapted on the release of the object by the first-named stop to arrest it at a second stopping position, and one of said stops movable in the direction of feed to permit the advance of the object and to arrest it at a third stopping position. 100

6. A feed mechanism comprising means for engaging a series of objects to be fed to impart to them a tendency to travel in a direction of feed, and stops adapted to arrest the foremost object and thereby hold back the following objects, one stop adapted to initially arrest the foremost objects in a stopping position, and another stop adapted on its release by the first-named stop to arrest it at a second stopping position and movable in the direction of feed to permit the advance of the object and to arrest it at a later stopping position. 105

7. A feed mechanism comprising a traveling conveyor, a series of objects to be fed resting on said conveyor so that they tend to 110

travel with it, and stops movable into the path of travel of said objects to arrest the foremost object in a stopping position, one of said stops movable in the direction of the feed to permit the advance of the object and to stop it at a later stopping position, and to release it and move backward to engage the next following object.

8. A feed mechanism according to claim 7, the stops relatively arranged and adapted so that the first arrests the foremost object in a first stopping position and then releases it, and the second arrests it in a second stopping position and then moves in the direction of feed to permit its advance, and stops to arrest the object in a later stopping position.

9. A feed mechanism according to claim 7, the stops relatively arranged and adapted so that the first arrests the foremost object in a first stopping position and then releases it, and the second arrests it in a second stopping position and then moves to permit its feed to a third stopping position where it arrests it.

10. A feed mechanism according to claim 7, the stops formed on arms, and cams connected to move said arms, adapted to move said stops reciprocally into and out of the path of travel of the objects, whereby each object is controlled by the stops in succession to arrest it in successive stopping positions.

11. A feed mechanism comprising a traveling conveyor, a series of trays resting on said conveyor, and stops adapted to arrest the foremost tray in a primary stopping position and to control its advance to a later stopping position, said stops adapted to engage respectively different portions of the trays one in advance of the other.

12. A feed mechanism comprising a traveling conveyor, a series of trays resting on said conveyor, said trays having projecting frames and stops adapted to arrest the travel of said trays in successive stopping positions, one stop engaging such frame at the rear of the tray and the other stop engaging the front of the tray.

13. A feed mechanism comprising a traveling conveyor, a series of objects to be fed resting on said conveyor so that they tend to travel with it, and stops for arresting the foremost of said objects in successive stopping positions, one of said stops movable both longitudinally and vertically whereby it may arrest the objects at successive points in their travel and may descend beneath the objects to permit them to be carried away.

In witness whereof, I have hereunto signed my name.

WILLIAM DIETER.