May 5, 1964 R. A. HAWLEY 3,131,647

TROLLEY FEED UNIT

Original Filed Jan. 15, 1962 2 Sheets-Sheet 1

Fig. 2

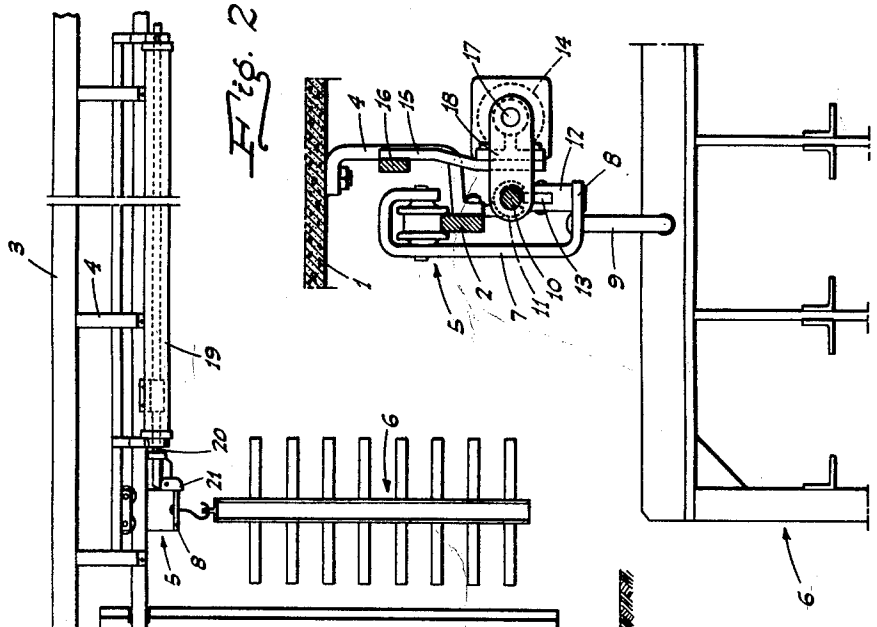
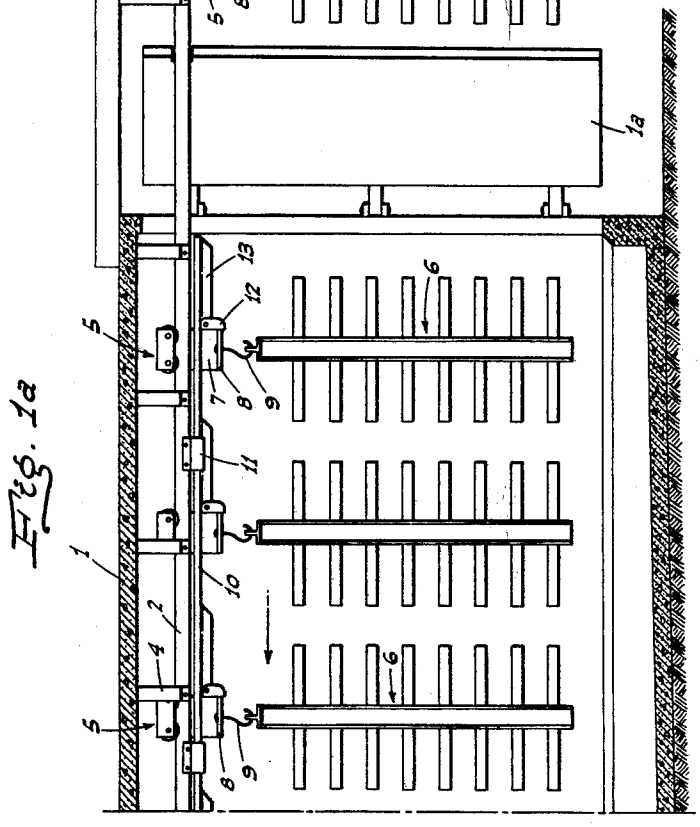


Fig. 1a



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May 5, 1964 R. A. HAWLEY 3,131,647

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Original Filed Jan. 15, 1962 2 Sheets-Sheet 2

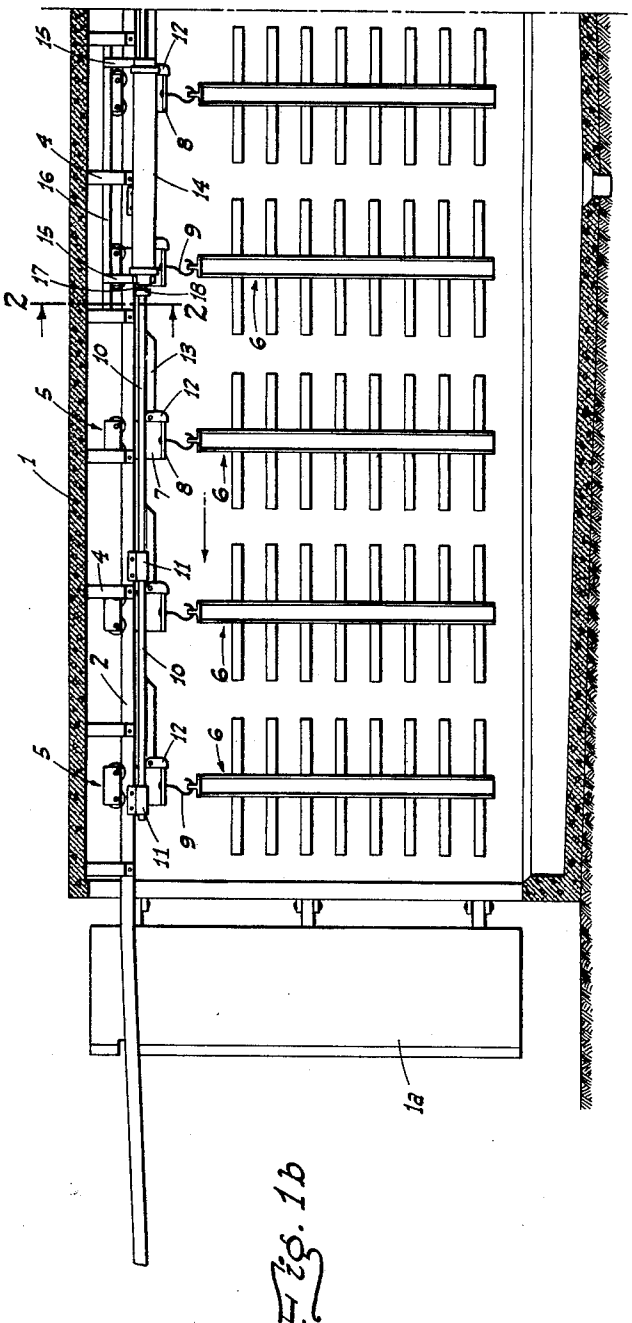


Fig. 1b

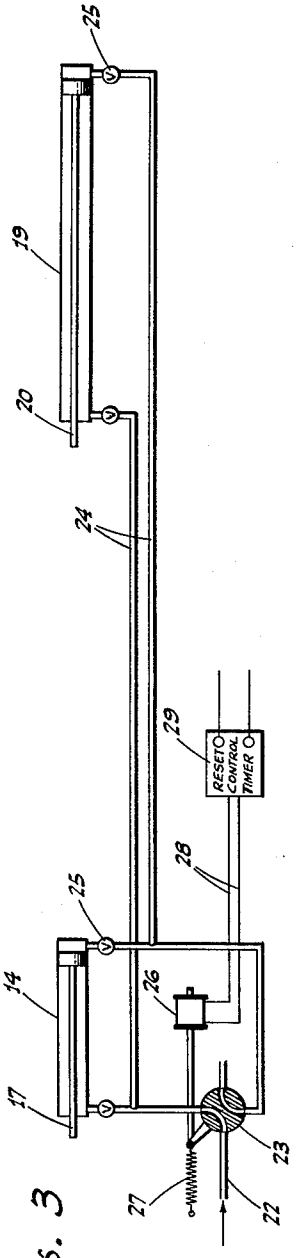


Fig. 3

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TROLLEY FEED UNIT

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Original application Jan. 15, 1962, Ser. No. 166,329. Divided and this application Sept. 17, 1962, Ser. No. 224,176

2 Claims. (Cl. 104—162)

This invention relates to a feed or advancing mechanism for rail-supported trolleys and the loads carried thereby, and particularly to one initially designed for use in connection with commercial food cooking or processing apparatus which includes an elongated cabinet through which the loaded trolleys are intermittently moved; the present application being a division of my copending application on such apparatus, Serial No. 166,329, filed January 15, 1962.

The major object of this invention is to provide a mechanism for intermittently feeding or advancing a row of load supporting trolleys as a unit along a predetermined path, and irrespective of whether or not such trolleys are enclosed or out in the open.

The mechanism includes a reciprocating power-actuated member to advance the trolleys, and another object of the invention is to provide control means for such member arranged to provide a time lag, of any desired extent, between successive advancing movements of the member while causing adjacent advancing and retractive movements thereof to take place in substantially uninterrupted succession.

It is also an object of the invention to provide a practical, reliable, and durable trolley feed unit, and one which will be exceedingly effective for the purpose for which it is designed.

These objects are accomplished by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings:

FIG. 1*a* is an elevation of the feed-in portion of the intermittently functioning trolley feeding mechanism, shown in association with the corresponding portion of a food processing cabinet.

FIG. 1*b* is a similar view of the remaining or discharge end portion of the mechanism, also shown in association with the corresponding portion of the cabinet; FIGS. 1*a* and 1*b* together forming the complete feed mechanism.

FIG. 2 is a fragmentary enlarged cross section taken on line 2—2 of FIG. 1*b*.

FIG. 3 is a diagram of the compressed air and electrical control system for the intermittent feed mechanism.

Referring now more particularly to the drawings, and to the characters of reference marked thereon, the intermittent feed mechanism which is the subject of this invention is here shown as extending through an elongated food-processing cabinet **1** of tunnel form initially open at both ends, and having entry and exit doors 1*a* at such ends; said cabinet being a part of the apparatus featured in the above identified copending application.

The feed mechanism comprises a horizontal rail **2** supported at intervals from the top of cabinet **1**, and from a longitudinal beam **3** of the like beyond the cabinet, by hangers or brackets **4** secured to said rail on one side thereof, as shown particularly in FIG. 2; said rail extending the full length of the cabinet **1** and a material distance outwardly beyond the entry end thereof.

A plurality of trolleys **5** ride the rail **2** and support depending racks **6** or other loads. The trolleys, which are all independent of each other, each include a frame **7** depending from the side of the rail **2** opposite the hangers **4**; said frame terminating in a horizontal flange **8** from

which a rack-supporting hook **9** depends; said flange and hook being some distance below the rail, but the hook being in vertical alinement therewith, as shown in FIG. 2.

Extending the full length of the cabinet **1** parallel to the rail **2** and disposed at a level between said rail and the flanges **8** of the trolleys **5** is a rod **10**, slidable through bearing sleeves **11** disposed at intervals along and supported from rail **2**. At evenly spaced intervals throughout its length, depending pivoted pawls **12** are mounted on one end of ribs **13** rigid with and extending lengthwise of the rod along the lower edge thereof. The pawls are in position to engage the rear edges of the frame flanges **8** of the trolleys **5**, and since the length of the cabinet **1** is such as to hold a certain number of evenly spaced trolleys and supported racks **6** therein, there is a corresponding number of pawls **12** mounted in connection with the rod **10**.

The pawls **12** are arranged so that they will remain rigid upon the forward movement of the rod **10** so as to then advance the various trolleys and racks therewith toward the exit end of the cabinet **1**. Said pawls **12** will, however, swing and yield upwardly with the rearward movement of the rod **10** so that said pawls will pass over the various flanges **8** without also retracting the trolleys and racks. Reciprocating movements of the rod **10** through a stroke not less than the spacing between adjacent trolleys and racks is imparted to said rod by means of a compressed air ram **14** (see FIG. 1*b*).

This ram is disposed in the cabinet intermediate the ends thereof parallel to the rod **10**, and preferably at the level thereof and laterally out therefrom on the side opposite the depending trolley frames, as shown particularly in FIG. 2. The ram **14** is mounted in a fixed position in the cabinet **1** by means of hangers **15** depending from a horizontal bar **16** which is supported from adjacent hangers **4**.

The piston rod **17** of the ram **14** is rigidly connected to the rod **10** by a bar **18**. It may here be noted that the rod bearing sleeves **11** are slit along the bottom in order to allow the ribs **13** to move therepast as the rod **10** is reciprocated, and so enable the sleeves to be close enough together for efficient rod support and guidance.

In order to advance a trolley **5** and rack **6** supported thereby into the cabinet **1** from in front of the same, another horizontal compressed air ram **19** is supported from the adjacent portion of the rail **2** back of the last named trolley in substantially the same manner as described in connection with ram **14**. The piston rod **20** of ram **19** is suitably connected to a pawl **21** positioned to engage the forward edge of the adjacent trolley **5**; said pawl being mounted for upward and rearward yielding movement just as are the pawls **12**, so that another trolley and rack may be moved along the rail to a position just rearwardly of the pawl **21** from ahead of the ram **19**.

When the piston rod **20** is fully retracted and the outside trolley **5** is in a pawl engaging position, said trolley and the rack **6** supported thereby are disposed some distance in front of the entry end of cabinet **1**, as shown in FIG. 1*a*. The ram **19** must therefore have a stroke considerably longer than that of ram **14** in order to move the outside rack into the cabinet **1** to the position originally occupied by the rack just inside the cabinet, and said inside rack is being moved forwardly a comparatively short distance.

In order to actuate the ram **14** in an advancing direction so as to move the trolleys of the row simultaneously and a distance equal to the spacing between adjacent trolleys, and at the same time actuate the ram **19** in the corresponding direction and through a stroke sufficient to move said other single trolley ahead of the position in-

itially occupied by the adjacent endmost trolley of the row, the control system shown in FIG. 3 is employed.

This system comprises a compressed air supply conduit **22** leading to a four-way valve **23**, from which branching conduits **24** lead to the corresponding ends of both rams **14** and **19**. Adjustable air-flow retarders or restrictors of conventional character, and indicated at **25**, are interposed in the conduits **24**. These retarders enable the timing of the strokes of the two rams to be accurately controlled, so that there will be no lag or over-run of the initially single trolley as it is advanced, relative to those of the row.

This system also includes a solenoid **26** to move the valve **23** in one direction, and a spring **27** to move said valve in the other direction. The solenoid is interposed in a circuit **28** in which a conventional automatic reset cycle control timer, indicated at **29**, is interposed. Normally, the solenoid **26** is deenergized, because of the circuit-opening action of the timer, and air is fed to the rams in a direction to hold their piston rods retracted, as shown in FIG. 3; the spring **27** then acting on the valve **23**. Then, when the timer functions to energize the solenoid, and which is for a period only sufficient at any one time to enable the various trolleys to be advanced, the valve position is reversed, and air is supplied to the rams to advance the trolleys. Upon the timer then acting to reopen the circuit, the spring **27** functions to return the valve to its initial position to cause the piston rods of the rams to be retracted. The timer then again functions after a time lag the length of which is determined by the operator.

From the foregoing description it will be readily seen that there has been produced such a device as will substantially fulfill the objects of the invention, as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described the invention, the following is claimed as new and useful, and upon which Letters Patent are desired:

1. An intermittent feed mechanism, for a row of rail-supported load-carrying trolleys, comprising means to advance the trolleys simultaneously a predetermined distance while maintaining the trolleys equally spaced apart, such means including a ram having a reciprocating stroke sufficient to advance the trolleys such predetermined distance, another trolley alined with but spaced from the endmost trolley of the row, before such row is advanced, a distance greater than said predetermined distance, another ram to advance said other trolley to the position initially occupied by said endmost trolley of the row, and means controlling the movement of the rams simultaneously and so that the row-advancing stroke of the first named ram will consume a time period the same as that necessary for the trolley advancing stroke of the last named ram.

2. A mechanism, as in claim 1, in which the last named means includes, with fluid supply conduits connected to the rams at the ends thereof, adjustable air-flow restriction devices interposed in the conduits.

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