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J. W. THOMAS

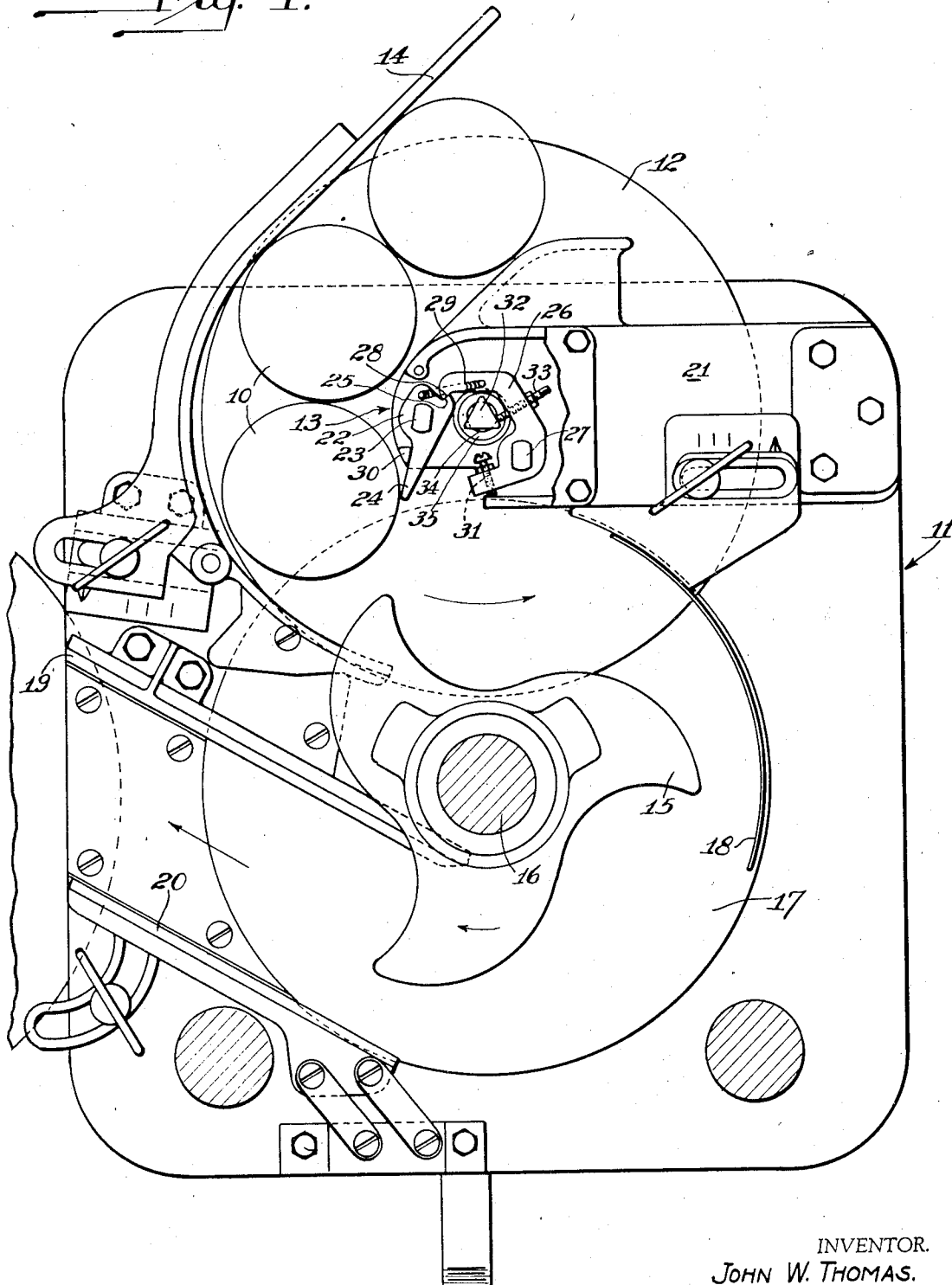
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CONTAINER CONTROL MECHANISM

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2 Sheets-Sheet 1

Fig. 1.



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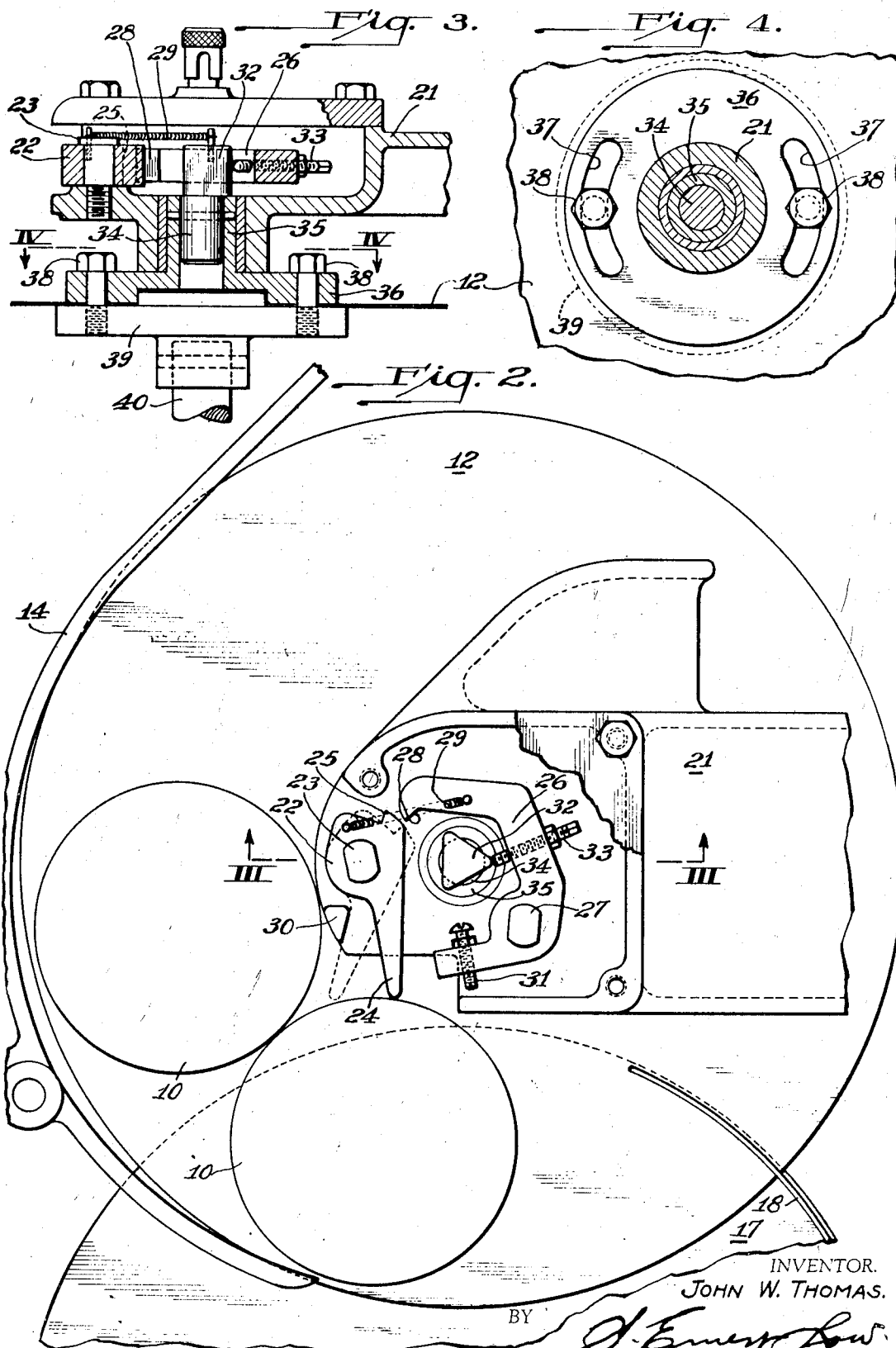
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CONTAINER CONTROL MECHANISM

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6 Claims. (Cl. 198—22)

This invention relates to a device for governing and controlling the advance of articles, such as containers, for example, by a conveyor, and relates particularly to that class of devices characterized by arm-like means, normally projecting into the path of travel of articles to arrest and control the forward movement thereof.

It is an object of this invention to provide improved and effective means to control the feeding of articles in timed relationship with the operation of an associated machine. It is also an object to provide an automatic device that is capable of operation at any rate required by the rate of operation of the associated machine, and this regardless of the direction of feed to the machine. It is a further object to provide a device to control the admission of random-fed containers to machines, such as filling, sealing and labelling machines, and the like. Still another object is the provision of a device characterized by few moving parts so actuated that it is particularly adapted to function without failure under the service conditions common to automatic container filling, sealing and labelling equipment.

These and other objects of the invention will be apparent to one skilled in the art from the following description of the accompanying drawings illustrating an embodiment of the invention in operative relationship with a container sealing machine, and in which:

Fig. 1 is a plan view of an embodiment and the attendant container-conveying mechanism of a sealing machine, with the sealing head removed;

Fig. 2 is a plan view of the embodiment of Fig. 1, showing the several parts during in-feed of a container;

Fig. 3 is a sectional view taken on the line III—III of Fig. 2; and

Fig. 4 is a sectional view taken on the line IV—IV of Fig. 3.

With reference now to Fig. 1, containers 10, such as bottles or the like, are conveyed in any suitable manner to a sealing machine, designated generally by the reference numeral 11. Forward movement of the containers upon a driven disc 12 is controlled by the feed timing device, identified generally by the reference numeral 13, and the adjustable guide 14. The star wheel 15, suitably secured to a driven vertical shaft 16, removes a container from the disc once it has been admitted by the timing device 13. The star wheel propels the container around the sealing platform 17 in a circular path partially defined by the guide 18. After a container is sealed by

a suitable sealing head (not shown), the guide 19 disposed angularly across the circular path, serves to disengage the sealed container from the star wheel. The succeeding containers following a like course discharge the preceding containers along the path defined by the guide 19 and companion guide 20.

The feed timing device 13, shown to advantage in Figs 1, 2, and 3, is provided with a bracket-like housing 21 conveniently attached to the sealing machine 11, so that it overhangs the disc 12. Gate member 22, pivotally secured to the housing by a threaded stud 23, has a forwardly disposed arm 24 of sufficient size to extend into the path of travel of the containers and arrest the movement thereof when maintained in latched position, and a rearwardly and preferably radially disposed shoulder 25. A gate latch 26, which is preferably substantially U-shaped, is pivotally secured to the housing 21 by a threaded stud 27 in such a manner that an end having a shoulder 28 can hook over and engage the gate shoulder 25 when the gate arm 24 is in container-restraining position, as shown in Fig. 1.

A spring 29 is suitably joined to both the gate 22 and the gate latch 26 to exert a force constantly tending to maintain those two parts in position of engagement determined respectively therefor by the housing stop 30 and screw 31. Positive latching of the gate 22 is accomplished, however, by disposition of the latch shoulder 28, when in engagement with the gate shoulder 25, so that the latch 26 forms an abutment immovable by the force exerted against the gate arm 24 by the arrested containers. Thus in-feed movement of the gate 22 is positively restrained by the latch shoulder until it is withdrawn.

A triangular cam 32 is positioned between the gate 22 and gate latch 26, for which a rounded end of the adjustable screw 33 carried by the latch between its axis of rotation and the latch shoulder 28 serves as a cam follower. As shown to advantage in Figs. 3 and 4, the cam shank 34 is suitably secured to the hub 35 of the flanged member 36 journaled in the housing 21. The flanged member 36 is provided with elongated slots 37 through which suitable means, such as cap screws 38, extend to secure it and the disc 12 to a second flanged member 39 coaxially therewith and with the shaft 40, to which the member 39 is suitably attached so that the disc 12 and cam 32 are driven directly by the shaft 40.

The operation of the feed timing device follows. As shown in Fig. 1, rotation of the disc 12 carries a container 10 to and forces it against

the projecting arm 24 of the gate 22, which is positively secured by engagement of the gate shoulder 25 and the end shoulder 28 of the gate latch 26. As shown in Fig. 2 rotation of the cam 32 to bring an actuating portion thereof against the follower 33 oscillates the gate latch 26 far enough to release the gate 22. The forward pressure of the container against the gate arm 24 is sufficient to overcome the opposing force 10 exerted by the spring 29 so that in-feed movement of the gate takes place. As shown in Fig. 2, the gate arm 24 rides against the advancing container until it is free thereof, whereupon it is returned by the spring 29 to its arresting position, indicated by broken lines, before the admission of another container and secured by the gate latch 26 which is likewise returned to its initial position by the spring 29.

The cam shaft 40 is driven in any well-known manner at the same rate as the three-arm star wheel 15, with which the operation of the sealing head (not shown) is timed, as is well known in the art. The triangular cam 32 consequently throws the gate latch 26 and releases the gate 22 25 the same number of times per revolution that star wheel arms pass the disc per revolution of the star wheel. Exact timing of the cam action to release the gate with the passage of a star wheel arm is obtained by rotational adjustment of the cam 32 and flanged member 36 made possible by the slots 37. With respect to the cam action, it is to be noted that the shape of the cam 32 is dependent upon the in-feed requirements of the associated mechanism and the rate 30 at which the cam can be conveniently driven in any given installation to produce the desired synchronism, and is, therefore, a matter of choice.

From the foregoing description it should be apparent that the device of my invention is suitable 40 for use with either left or right hand feed machines of widely varying types, and also that its few and compactly arranged parts are capable of operation at any desired speed with little lost motion and stress. The advantages of such properties and characteristics are obvious in connection with the speeds at which modern packaging equipment is operated.

Thus, having provided a full and adequate description of an embodiment of my invention, and 50 with the intent to include all embodiments and modifications coming within the true boundaries of the invention, I claim:

1. A device for controlling the movement of containers by a conveyor comprising arcuately 55 movable container arresting means normally projecting into the path of container travel and movable from said path by container pressure, arcuately movable means for positively securing said arresting means in said projecting position 60 by engagement therewith, resilient means connecting said arresting means to said securing means and opposing disengagement thereof, and rotatable means for disengaging said arresting means and said securing means to permit movement of said arresting means from said container 65 path at predetermined intervals.

2. A device for controlling the movement of containers by a conveyor comprising arcuately 70 movable container arresting means normally projecting into the path of container travel and movable from said path by container pressure, an arcuately movable abutment member for positively securing said arresting means in said projecting position by engagement therewith, resilient means connecting said arresting means 75

to said abutment member and opposing disengagement thereof, and rotatable means disposed between said arresting means and the pivotal axis of said abutment member and adjoining said latter member for periodically moving said abutment from engagement with said arresting means 5 to permit movement of said arresting means from said container path at predetermined intervals.

3. A device for controlling the movement of 10 containers by a conveyor comprising an oscillatable gate normally projecting into the path of container travel and movable from said path by container pressure, an oscillatable abutment for positively securing said gate in said projecting 15 position by engagement therewith, a spring connected to both said gate and said abutment and opposing disengagement thereof, and a rotatable cam disposed between said gate and the pivotal axis of said abutment to withdraw said abutment 20 from said gate to permit movement of said gate from said container path at predetermined intervals.

4. A device for controlling the movement of 25 containers by a conveyor comprising an arcuately movable gate normally projecting into the path of container travel and movable from said path by container pressure, said gate having a rearwardly disposed shoulder, an arcuately movable latch having a shoulder adapted to positively 30 secure said gate in said projecting position by engagement with said gate shoulder, resilient means connecting said gate to said latch and opposing disengagement thereof, and a rotatable cam adjoining said latch and adapted to move 35 said latch from engagement with said gate at predetermined intervals to permit movement of a container past said gate during each period of disengagement.

5. In a machine having means for conveying 40 containers and means adapted to receive containers from said conveying means, means for controlling the movement of containers from said conveying means to said receiving means comprising arcuately movable container arresting means 45 normally projecting into the path of container travel on said conveying means and movable from said path by an arrested container, arcuately movable means for positively securing said arresting means in said projecting position by 50 engagement therewith, resilient means connecting said arresting means to said securing means and opposing disengagement thereof, and rotatable means adjoining said securing means and adapted to periodically disengage said securing 55 means from said arresting means in timed relationship with presentation of said container receiving means in receiving position to permit movement of a container adjoining said arresting means past said means during said periods of 60 disengagement.

6. In a machine having means for conveying containers and means adapted to receive containers from said conveying means, means for 65 controlling the movement of containers from said conveying means to said receiving means comprising an arcuately movable gate normally projecting into the path of container travel on said conveying means and movable from said path 70 by an arrested container, an arcuately movable latch for positively securing said gate in said projecting position by engagement therewith, resilient means connecting said gate to said latch and opposing disengagement thereof, and a rotatable cam adjoining said latch and adapted 75

to periodically disengage said latch from said gate, said cam having a rotatably adjustable coupling to a shaft driven in timed relationship with the actuation of said container receiving means, whereby said periods of disengagement of said gate can be accurately timed with presenta-

tion of said receiving means in position to receive a container carried past said gate by said conveying means during disengagement of said gate and latch.

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