The object of the present invention is to provide mechanism associated with cigarette packing machines and adapted to identify and throw out faulty packages, that is to say packages which are incompletely filled. The invention will be described in connection with the accompanying drawings, in which—

Figure 1 is a side elevation, largely diagrammatic and fragmentary, of a packing machine to which has been applied an embodiment of the invention, and

Figure 2 is a transverse section on the line 2—2, looking in the direction of the arrow;

Figure 3 is a detail side elevation similar to Figure 1 and showing the action of the pawl throw-in mechanism.

Referring to Figure 2 of the drawings, 1 and 2 illustrate in cross section two horizontal plates forming between them a packing can into which, in the present case, ten cigarettes are fed by any suitable means. The lower plate 2 is formed with a channel-way 3 to permit the passage of the vertical web 4 of an ejector 4 which is driven by suitable means and which has an ejecting plate a shown in dotted lines, Figure 2. The ejector is adapted to push the cigarettes out of the packing canal and into a waiting package, whereupon the latter is carried along for sealing in the usual manner, the mechanism for this purpose not being shown.

As the cigarettes are fed into the packing canal, in order that the desired number of ten cigarettes may be determined, the initial cigarette b lying farthest to the right, Figure 2, is pushed against a trigger 5 carried by a pin 6 which is mounted for both oscillation and rocking movement relatively to a supporting member 7. The movement of trigger 5 by cigarette b carries the trigger beyond the path of the ejector plate a. If, however, less than ten cigarettes are fed into the packing canal, trigger 5 remains in the path of the ejector plate a and is given a movement by said plate in the ejection of the cigarettes, which movement is transmitted to other members as will now be explained.

Pin 6 has connected thereto a lever 8 which has a depending extension and a hook end 8'. Adjacent the hook 8' is an endless chain 9 running over two sprockets 10, 10'. On chain 9 there is fastened a number of paws corresponding to the number of the ejectors 4. The paws 10, are connected to the chain by means of pins 11 in such manner that the paws may be accurately moved backward from the position shown at the right hand end, Figure 1, to the position shown at the left hand of said figure. Each pawl has secured thereto a relatively wide plate 12 which normally lies flat on the chain 9 and passes above the hook 8' of lever 8, as illustrated in Figure 2.

As soon, however, as an insufficient number of cigarettes are fed into the packing canal and trigger 5 is not moved sidewise but remains in the dotted line position 5', Figure 2, ejector plate a engages it during the ejection of the cigarettes from the packing canal and causes oscillation of pin 6, thereby throwing hook 8' of lever 8 into the path of the pawl. The result is that the pawl 10 engages the hook of the lever and the latter causes the pawl to swing backwardly to the dotted line position, Figure 3.

In the path of the filled package are two forwarding rolls 13, 14 preferably made of rubber, which act to receive and impart a movement to the package. The rolls run with a relatively high speed so that the package, c, is thrown to the left from its position shown in Figure 1 a certain distance of its own momentum. In front of the rolls 13, 14 is a standard 15 supporting a shaft 16 upon which is pivotedly supported an angular lever A having a vertical portion 17 and a horizontal portion 17'. The depending vertical portion of lever A extends within the path of the pawl 32 when the latter is raised to the dotted line position, Figure 3, and the pawl thus swings the lever A to the dotted line position, Figure 1. In the rear of the rolls 13, 14 is a vertical guide-way 18 which receives a movable abutment plate 19 carried by an arm 20 connected by pin 21 to the horizontal member 17' of lever A. Over the path of the package c is arranged a flat spring 22 which is carried by abutment plate 19. When the pawl 10 is thrown rearwardly by arm 8 and reaches lever 17 it is in a position to rock said lever, the continued movement of the pawl by chain 9 throws lever 17 to the dotted line position, Figure 1. The lever by its
connection with arm 20 raises the abutment, pin 21 moving in slot 21. Meanwhile the incompletely filled package is gripped by the rolls 13, 14 and slides under the abutment, falling out of the machine to a receiving surface. After this the lever 17 becomes free from the pawl 10 and drops so that the abutment returns to its initial position.

So long as the packing machine operates properly and the predetermined number of cigarettes are placed into the packages, pawl 10 is not thrown back but moves freely over the end of lever 8 and remains in such position, passing under lever 17 without moving it. The packages as they are forwarded by rolls 13, 14 are thrown toward the abutment 19 and at the same time the spring 22 stops each package gradually and holds it from bouncing back. In this position the package is seized by suitable conveyor mechanism (not shown) and carried off, usually at right angles to the previous direction of movement.

The pawls 10 turn on their pins 11 as the chain runs downwardly on sprocket 10 so that the free end of each pawl is pointed down. Beneath the sprockets 10 and 10' is a U-shaped guide plate 23, the latter extending around sprocket 10 for about half its circumference. The end of the guide plate on the underside of sprocket 10' is bent upwardly so that the free end of the pawl is moved into the guide plate in such manner that the plate turns the pawl backwardly into a normal position on the chain 9.

It will be understood that various modifications may be made in the embodiment of the invention illustrated in the drawings, without departing from the spirit of the invention, what I claim and desire to secure by Letters Patent being as follows:—

1. In throw-out mechanism for cigarette packing machines, means for receiving a train of cigarettes, throw-out mechanism for incompletely filled packages of cigarettes, a trigger lying in the path of the train of cigarettes, a connection between the trigger and the throw-out mechanism, and means whereby less than a predetermined number of cigarettes fed to the receiving means will cause said trigger to assume a position whereby it may be swung to render the throw-out mechanism active.

2. In throw-out mechanism for cigarette packing machines, means for receiving a train of cigarettes, an actuator for delivering said cigarettes from the receiving means to a packaging device, means for receiving the packaged cigarettes, a trigger lying in the path of said actuator, means for throwing out imperfectly filled packages and a connection between said means and the trigger whereby when less than a predetermined number of cigarettes are fed to said receiving means the trigger lies in the path of the actuator and is moved thereby to set the throw-out means into action, and when the predetermined number of cigarettes are fed to the receiving means the trigger is moved thereby out of the path of the actuator.

3. A device constructed in accordance with claim 2 in which the throw-out mechanism comprises a device adapted to receive the packages of cigarettes in combination with means for carrying the device out of the path of the packages when an incompletely filled package is moved toward the same.

4. A device constructed in accordance with claim 2 in which the throw-out means comprises an endless chain provided with a series of pawls, a device actuated by the trigger for throwing individual pawls into active position, an abutment, and a lever for actuating said abutment, said lever being adapted for actuation by one of said pawls when the latter is thrown into active position.

5. In throw-out mechanism for cigarette packing machines, means for receiving a train of cigarettes, an actuator adapted to move the train to packing mechanism, means adapted to receive the packaged cigarettes, a trigger lying in the path of both the actuator and the train of cigarettes and adapted, to be moved by a predetermined number of the latter out of register with the actuator, a lever for deflecting said receiving means to permit the passage of an incompletely filled cigarette out of normal delivery position, and means intermediate the trigger and lever for actuating the latter.

6. In throw-out mechanism for cigarette packing machines, means for receiving a train of cigarettes, an actuator adapted to be moved into a given position when the train contains a predetermined number of cigarettes, throw-out mechanism connected with said actuator and held inactive when the actuator is within the stated position, less than the predetermined number of cigarettes permitting movement of the actuator to such position that the throw-out mechanism is rendered active, the throw-out mechanism including a revolving roll to receive and actuate packages of cigarettes, an abutment against which the packages are normally thrown and means for retracting said abutment to permit passage of a given package out of normal position.

7. In throw-out mechanism for cigarette packing machines, means for receiving a train of cigarettes, an actuator adapted to be moved into a given position when the train contains a predetermined number of cigarettes, throw-out mechanism connected with said actuator and held inactive when the actuator is within the stated position, less than the predetermined number of cig.
rettes permitting movement of the actuator to such position that the throw-out mechanism is rendered active, the throw-out mechanism including a revolving roll adapted to receive and actuate packages of cigarettes, an abutment against which the packages are thrown by the roll, a spring which prevents recoil of the packages, and means for retracting the abutment and spring to permit movement of a given package of cigarettes out of normal position.

In testimony whereof, I have signed my name to this specification:

EWALD KOERNER.