June 25, 1963 A. A. TOBIAS 3,095,114

PACKET EJECTOR WITH OPTIONAL LATCH

Filed Sept. 14, 1960 2 Sheets-Sheet 1

Fig. 1.

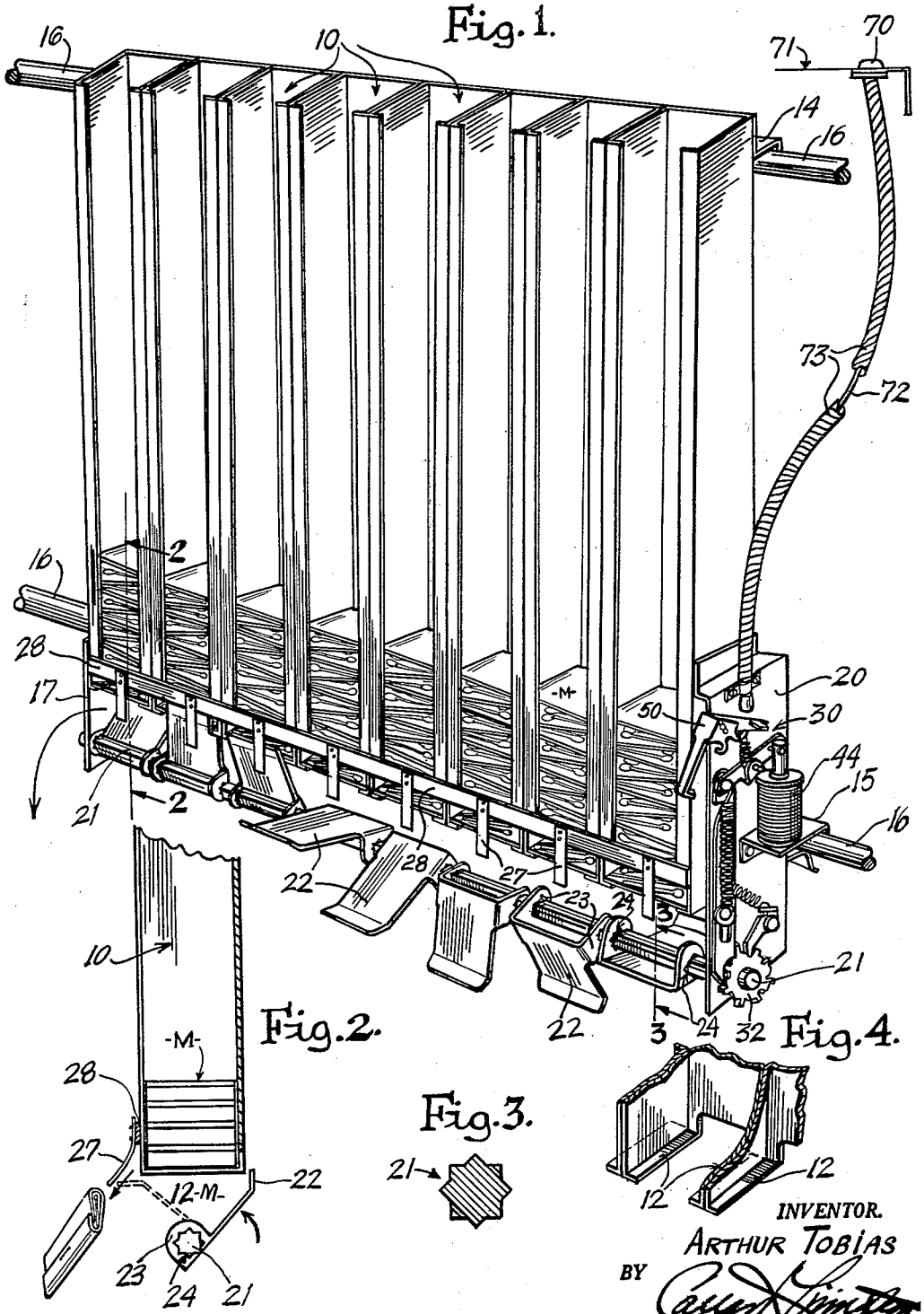


Fig. 2.

Fig. 3.

Fig. 4.

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Filed Sept. 14, 1960 2 Sheets-Sheet 2

Fig. 5.

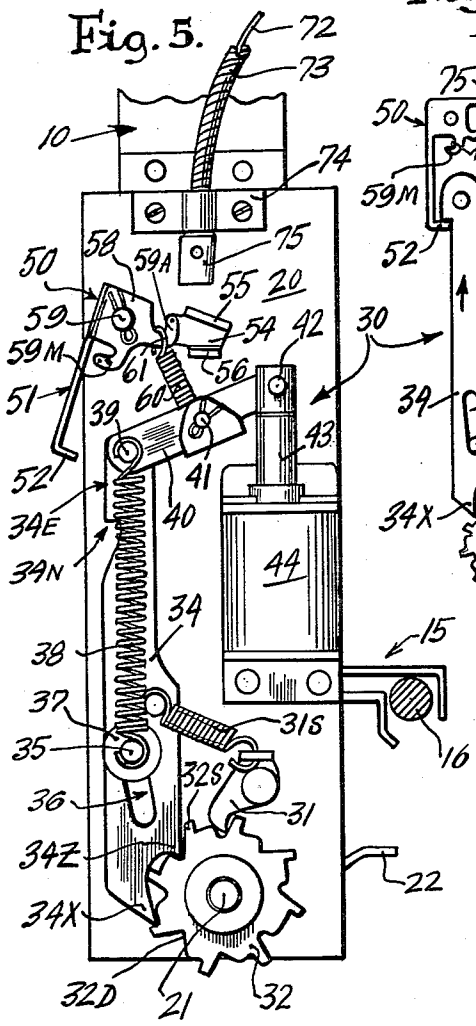


Fig. 6.

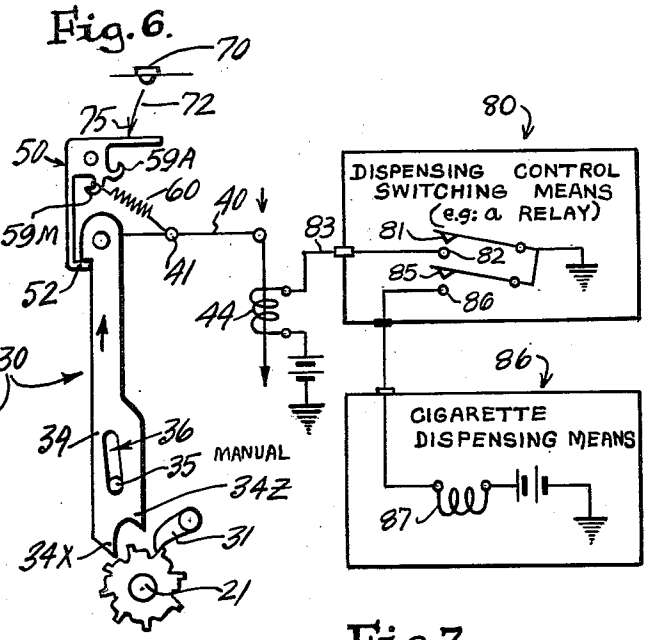
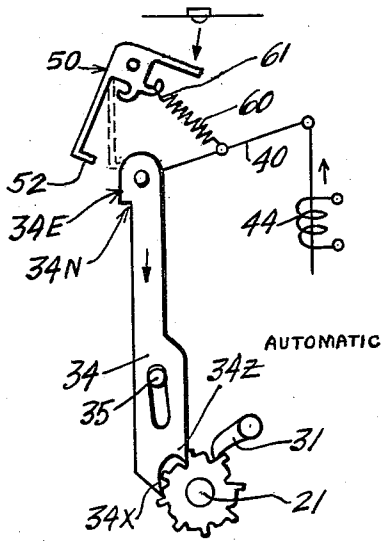


Fig. 7.



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PACKET EJECTOR WITH OPTIONAL LATCH

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The disclosed improvements relate to mechanisms for dispensing packets, like books of matches, for use particularly in conjunction with cigarette vending machines, the principal object being the provision of a simplified mechanism which can be pre-set to dispense a packet of matches only as the result of pressing a special button provided for that purpose; or in the alternative automatically as the result of each dispensing operation of the associated cigarette vending apparatus.

Viewed from another aspect, the improved dispensing mechanism provides an electro-magnetically actuated pawl and ratchet drive and associated ejecting means which advances uni-directionally to eject one packet of matches at a time from each of several magazine columns in succession, the electro-magnetic drive means being pulsed or energized concomitantly with each electrical actuation of the associated cigarette vending machine, the means for predetermining whether the dispensing of the matches shall be automatic or manual being of a simple mechanical nature and involving a latching device which is disabled if the match-dispensing operation is to be automatic, and which is rendered operative to latch up the dispensing action of the ejecting mechanism in case the operation is to be manual, the customer operating a delivery button in those instances where he desires matches, and that button being effective to trip out the latch means.

More detailed objects and aspects of novelty and utility relate to particulars of the construction and operation of the embodiment described hereinafter in view of the annexed drawings, in which:

FIG. 1 is a perspective view of the entire match-dispensing unit;

FIG. 2 is a fragmentary sectional detail through one of the magazine columns, as viewed in the direction of line 2—2 of FIG. 1;

FIG. 3 is a cross-sectional detail through the octagonal gang ejector rod looking along line 3—3 of FIG. 1;

FIG. 4 is a sectionalized fragmentary perspective detail through the bottom sustaining ledge of one of the magazine columns;

FIG. 5 is a side elevation to enlarged scale of the pawl and ratchet mechanism;

FIG. 6 is a schematic operational and circuit diagram illustrative of the manual pre-set condition;

FIG. 7 is a schematic operational diagram illustrative of the pre-set automatic operation.

The match-dispensing unit depicted in FIG. 1 will usually be installed in the cabinet (not illustrated) of an associated cigarette-vending machine which embodies the usual coin-deposit and control mechanism with brand-selection buttons or levers, and a delivery chute or shelf onto which the selected package of cigarettes will be discharged on deposit of the necessary coin or coins, all in a manner well understood in the art.

Such machines frequently include some form of match dispenser operative either automatically or selectively to eject a packet of matches with the package of cigarettes dispensed, the matches invariably being delivered into the same delivery chute or bin as the cigarettes. In many instances, the patron does not intend to take the matches, and it is considered in some types of operation as an economy as well as a safety measure to withhold delivery thereof unless the customer is sufficiently interested to actuate a special delivery means to cause ejection of the matches. In some locations, however, it may be desirable or mandatory to deliver matches automatically with the purchase of the cigarettes.

The match-dispensing mechanism of FIG. 1 consists of a plurality of columnar stacking magazines **10** fabricated from sheet metal and secured in side-by-side assembly as an integrated unit, the columns being open at top and bottom and on one side, the loading of the packets being effected through the open tops, and ejection being effected from the bottoms of the stacks, there being suitable flanges **12** (FIG. 4) at the bottom of each column to support the lowermost packets M in each column, as in FIG. 2.

Attached to the rearward side of the magazine assembly are hook-like upper and lower hanger brackets **14** and **15**, respectively adapted to hookingly engage and rest upon a pair of upper and lower cross rods **16** (FIG. 5, also), which are supported interiorly of the associated cigarette-vending machine cabinet (not shown), the lower or discharge ends of the several magazines respectively overlying the discharge bin or receptacle for such machine for the dispensing purposes previously mentioned.

Journalled on lower journal plates **17** and **20** (FIG. 1), affixed to the opposite lower end walls of the assembly, is a long shaft **21** of octangular cross-section (as in FIG. 3) upon which are spaced a series of angularly offset ejector pawls or fingers **22** located at relatively equiangular distances about the shaft, one beneath each magazine column.

Each ejector pawl has a pair of integral trunnion arms **23** in which are aligned octagonal holes **24** (FIG. 2) in order that each pawl may be easily set on the shaft in proper angular rotation away from its neighbor. In one complete rotation of the shaft **21** one packet of matches M will be ejected from the bottom of each of the eight magazine columns by the series of eight paddle-like ejector pawls **22**, each column at its bottom having a narrow blade spring **27** carried on a cross bar **28** (FIG. 1) so as to be disposed in yieldingly blocking position before the bottom discharge exit of the appertaining column, each spring finger serving to retain the lowermost book of matches in its column, but yielding (as in FIG. 2) to permit passage thereof on forcible ejection by the appertaining pawl **22**.

Mounted on the side plate **20** (FIG. 1) is an electromagnetic pawl and ratchet means, generally indicated at **30**, for stepping the ejector pawl shaft **21**, said mechanism comprising the parts shown to larger scale in FIG. 5, including an especially evolved ratchet wheel **32** fast on the shaft **21** to turn the latter, and a long upstanding drive pawl **34** retained slidably on said plate by means of a pin **35** fixed on the plate and projecting through a long angularly pitched slot **36** in the pawl, so that the latter can move up and down relative to the pin, the pin in turn having a retaining washer **37** secured thereon by one end of a drive spring **38**, whereby the pawl is prevented from escaping the pin.

At its upper end the drive pawl is pivotally linked by a pin **39** to one end of a formed lever **40** pivoted on another pin **41** secured in the plate **20**, the opposite end of the lever being linked by pin means **42** to the plunger **43** of an electromagnetic solenoid **44** carried by said plate.

The drive spring **38** pulls the pawl down to the limit permitted by slot **36** and accordingly elevates the solenoid plunger; but when the latter is attracted on energization of the coil the drive pawl is raised and on deenergization of the coil **44** will be driven down again in its working stroke by the spring **38**.

At its lower end, the ejector pawl has two teeth **34X** and **34Z**, the latter of which engages behind the deeper drive teeth **32D** on the ratchet wheel, and the former of which engages behind the shallower stop teeth **32S** of said wheel, in the progressive manner illustrated schematically in FIGS. 6 and 7. Retrograde motion of the

ratchet wheel is prevented by a holding pawl 31 pivoted on the plate 20 and urged by a spring 31S into the ratchet teeth.

When the coil 44 is energized the pawl 34 is elevated to its cocked or advancing position with a further tensioning of the drive spring 38, it being noted that the long slot 36 is angled somewhat toward the ratchet wheel so that the pawl teeth tend to withdraw outwardly as well as upwardly in the solenoid-driven or setting phase of their reciprocable travel, and during the return or working stroke when solenoid 44 is deenergized the driving pawl 34X will engage first in the shallower teeth as aforesaid to execute the shaft-advancing phase of the stroke, while the stop pawl 34Z will properly approach the next stopping tooth 32S owing to the pitch of the long slot 36.

Thus, if the selective latching control means is not operative, a proper pulsing of coil 44 in conjunction with the action of the drive spring 38 will always effect one ratchet-advancing reciprocation of the drive pawl 34 sufficient to cause ejection of one packet of matches by one of the ejector pawls 22.

The selective latching control means, shown in FIG. 5, comprises a rockable latch lever 50 in the form of a metal stamping having one arm 51 provided at its end with a latching offset or nose 52, and another arm 54 having an offset striker tab 55 at its free end, adapted to engage a smaller offset stopping lug 56 struck out from the plate 20 and situated below the striker tab and just above the pivotally supported part of the solenoid lever at 41.

The two latch-lever arms 51 and 54 are preferably formed at right angles to each other with an offset intermediate portion 58 of the metal turned over at their juncture and pierced to receive a pivot pin 59 fixed on the base plate. Also formed as part of the intermediate offset 58 are two oppositely disposed spring-anchoring hooks 59A and 59M, respectively located on opposite sides of a reference radius from pin 59 extended generally toward the pivotal axis of the solenoid drive lever at pin 41.

A selector spring 60 is anchored at one end on the pin 41 and has a loop 61 at its opposite end engageable optionally with one or the other of the two hooks 59A or 59M, which are respectively the hooks for "automatic" and manual selection positions.

When the spring 60 is anchored on the hook 59M, the selector lever 50 is urged counterclockwise and will thrust the latching nose or pawl 52 against the riding edge portion 34E of the driving pawl (dotted lines, FIG. 7) in readiness to enter the latching notch 34N thereof automatically when the driving pawl rises into the setting or cocking position, as illustrated schematically in FIG. 6, with the result that the return driving stroke cannot be completed until the latch is released by pivoting of the latch lever 50 clockwise.

Release of the latch lever is effected manually at the option of the patron of the machine as the result of his pushing a match-delivery button 70 (FIGS. 1 and 6) conveniently located, for instance on top panel portion 71 of the cigarette or other vending machine with which the novel packet dispensing mechanism is associated, said button in turn actuating a stiff drive wire 72 guided in a flexible cable tube 73 anchored at its lower end on the plate 20 by means of a cleat 74, there being a plunger head 75 secured to the lower end of the drive wire in a position overlying the striker tab 55 on the latch lever.

Thus, when the patron depresses the delivery button 70 the drive wire is forced down and the plunger 75 engages the offset tab 55 rocking the latch lever clockwise to withdraw the latching part or pawl 52 so that the ratchet drive lever can complete its spring-urged ratchet-advancing stroke and dispense one packet of matches.

For automatic operation the selector spring 60 is transferred to the hook 59A, which rocks the latch lever 50 clockwise and maintains it constantly in non-latching relation to the drive pawl (as in FIG. 5) with the result that a packet of matches will be dispensed with every pulsing of the solenoid coil 44, since complete reciprocation of the drive pawl results when the latch lever is thus disabled in the "automatic" or 59A hook position of the selector spring, as aforesaid.

In commercial adaptations of the novel dispensing unit to cigarette vending machines, it is preferred that the coil 44 shall be pulsed concurrently with each and every cigarette-dispensing operation, it being usual in such machines to employ some form of electrically-controlled or actuated package-ejecting means (not shown) for effecting the ejection of a package of cigarettes after the brand selection has been made by the patron and the proper coins have been deposited. Such package ejector actuators may be in any of the well-known forms such as an electric motor or a solenoid drive mechanism or the like, which will usually be energized through the intermediary of a relay or like dispensing control switch means.

Accordingly, the dispensing coil 44 of the present disclosure is preferably connected for energization by such cigarette-dispensing control switch means, whatever its form, so that the match-dispensing coil 44 and lever 34 will be operated every time a package of cigarettes is dispensed; and, depending on the setting of the selector spring 60, a packet of matches will be dispensed either automatically with the cigarettes or as a result of manual opeartion of the button 70.

One illustrative circuit arrangement embodying the aforesaid concurrent operation of the match- and cigarette-dispensing mechanisms is depicted in FIG. 6, wherein the coil 44 is connected for coaction with a cigarette-dispensing control switch means 80 which may be, for example, the switch of a dispensing or "vend" relay in the associated cigarette machine, and which will include normally open contacts 81 and 82 connected to energize upon closure, via conductor 83, the match-packet ejecting coil 44, said switch means also preferably including additional contacts 85, 86, closable simultaneously with contacts 81 and 82 to energize the cigarette-ejecting or dispensing control means schematically indicated at 86, as by energizing a suitable relay, ejector, or other electrical means 87, which may be a motor type cigarette-pack ejector, or a solenoid-driven type of ejector, such as previously mentioned, and both of which are well-known in the art, whereby concurrent energization of the electrical cigarette-dispensing means 86—87, whatever its form, and the match-packet dispensing coil 44 will be achieved.

The described match-dispensing mechanism with particular attention to the electromagnetic actuating mechanism thereof has the advantage that on manual setting repeated operations of the cigarette dispenser control switch and circuit produce substantially no mechanical action in the match-dispensing mechanism, the plunger of the solenoid remaining down until the manual releasing operation is effected with the result that the momentary concomitant energization of the solenoid coil is substantially the only action produced by actuation of the cigarette dispensing control switch means, and this energization produces no appreciable mechanical movement in the parts of the match-dispensing mechanism, and the impedance of the solenoid in this condition is at a maximum so that current and heating effects are reduced as well for unlimited repeat operations of the cigarette machine until such time as the manual release is operated.

I claim:

1. Actuating mechanism for a package-ejecting mechanism to be selectively pre-set for automatic or manually-controlled ejecting action, and comprising, namely: an ejector shaft to be advanced unidirectionally step-by-step; a ratchet wheel fast with said shaft; a reciprocable driving pawl for advancing said ratchet wheel in steps, said pawl being provided with latch means; cooperative electromagnetic and spring means operatively connecting

with said pawl for reciprocating the same; and selectively pre-set latch means for said pawl including a latch lever pivotally mounted adjacent thereto and having a latching part cooperable with the latch means on said driving pawl disposed for movement into latching relation with said pawl in a certain position thereof responsive to rocking of the latch lever in a certain direction, and movable out of said latching relation responsive to movement in an opposite direction; spring-attachment means on said latch lever on opposite sides of the rocking axis thereof together with selector spring means having optional operative connection with said latch lever at one or the other of the attachment means on respectively opposite sides of the rocking axis thereof as aforesaid and effective to urge the latch lever either in said certain direction or oppositely thereto depending upon which of said optional connections is used, whereby said lever is rendered effective to latch the pawl or rendered inoperative for this purpose; and manually operable means having an impositive driving relation with said latch lever for moving the same out of latching engagement with said pawl.

2. In a machine for dispensing cigarette packages and having a principal dispensing circuit adapted to be energized for each dispensing operation thereof, pre-selectively set mechanism for optionally dispensing a packet of matches either automatically or manually in any cigarette dispensing operation as aforesaid, said mechanism comprising: an upright magazine for stacking packet matches and having a sidewise packet-ejection passage at its bottom; a shaft mounted beneath said magazine bottom for rotational movement; a packet-ejector member moved by said shaft in a direction to engage and eject the bottommost packet responsive to a rotative displacement of the shaft; a reciprocable pawl and cooperative ratchet means driven thereby for displacing the shaft as aforesaid, said pawl having latchable means; electromechanical drive means energizable to effect reciprocatory driving action of said pawl; a latching device comprising a piovted latch having a first position for operational latching coaction with said latchable means on the pawl to releasably latch the same against completing the aforesaid driving action in any reciprocatory cycle thereof, said pivoted latch having a second position in which it is incapable of such latching coaction with the said latchable means on the pawl; pre-selective spring means having two points of optional operating connection with said pivoted latch, a first of which yieldingly urges the said pivoted latch into said first position, and the second of which holds the said pivoted latch in said second position; means situated on respectively opposite sides of the pivotal axis of said pivoted latch each constituting one of said two operating connections; latch release means including a member manually actuated to engage said pivoted latch and move the same out of latching relation to said pawl; and circuit means connecting said electromechanical means with said principal circuit for energization concomitantly with the latter to energize the electromechanical means whenever said principal dispensing circuit is energized.

3. Mechanism according to claim 2 further characterized in that there are a plurality of said magazines arranged along the length of said shaft and said shaft has a corresponding number of said ejector members mounted on and moved by the shaft, one for each magazine, and said ejector members are displaced about said shaft in relative positions such that the packet-ejecting actions thereof are effected from successive magazines responsive to unidirectional rotative motions of said shaft effected by repeated energizations of said electromechanical means.

4. Mechanism according to claim 3 in which said ejector members are in the form of fingers having a pair

of aligned trunnion flanges on opposite sides of the axis of rotative travel thereof and said flanges have aligned identical polygonal holes therethrough, said shaft having a polygonal cross-section matching and drivingly interfitting with the polygonal shape of said holes, and the number of said sides of the polygon corresponding to the number of said magazines, whereby the ejector members may be angularly positioned about said shaft for successive ejecting action as aforesaid.

5. In combination with a switch means and circuit means controlled thereby for actuating a cigarette dispensing mechanism, electrically actuated mechanism for dispensing match packets, said electrically actuated mechanism being connected in an operating circuit controlled by said switch means for concomitant dispensing operation of both dispensing mechanisms; releasable preventing means automatically operating to prevent completion of each match-packet dispensing operation; and manually operable means for releasing said preventing means to effect dispensing of a packet of matches.

6. In combination with a first dispensing mechanism having electrically controlled means for dispensing a first article, and switch means operable to actuate said means, a second dispensing mechanism including electro-mechanical means operable to dispense a second article and provided with releasable means cooperable with said electro-mechanical means for automatically preventing completion of each dispensing operation thereof; means operable for releasing said preventing means; and means cooperable with the said releasing means and optionally settable manually in one of two operating conditions in the first of which it is effective to prevent completion of the dispensing operation as aforesaid, and in the second of which it is disabled from such preventing action, whereby the dispensing operation of the second dispensing means may optionally be rendered automatic or manual.

7. For use in a dispensing mechanism of the type employing a rotatable shaft having a plurality of ejector fingers spaced along its length and projecting in a generally radial sense therefrom at identical or selectively different angular spacings thereabout relative to another finger thereon, improvements in said fingers and means for selectively mounting the same on the shaft comprising, namely: a shaft having a cross-section of symmetrical polygonal configuration providing not less than five dihedral angles; and flat, paddle-like selector fingers for said shaft each comprising an elongated strip of rigid material of substantial width having formed near one of its longitudinal ends, as an integral part thereof, a pair of aligned, parallel hub projections extending in like directions substantially normal to the plane of the strip and constituting a pair of spaced keying hubs, said hubs each having a shaft-fitting hole in register with the other and of like polygonal cross-section with the shaft to be slidably fittable on the latter in any of a plurality of positions of angular displacement thereabout relative to another such finger thereon, the number of such positions being equal to the number of sides of the polygonal configuration.

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