

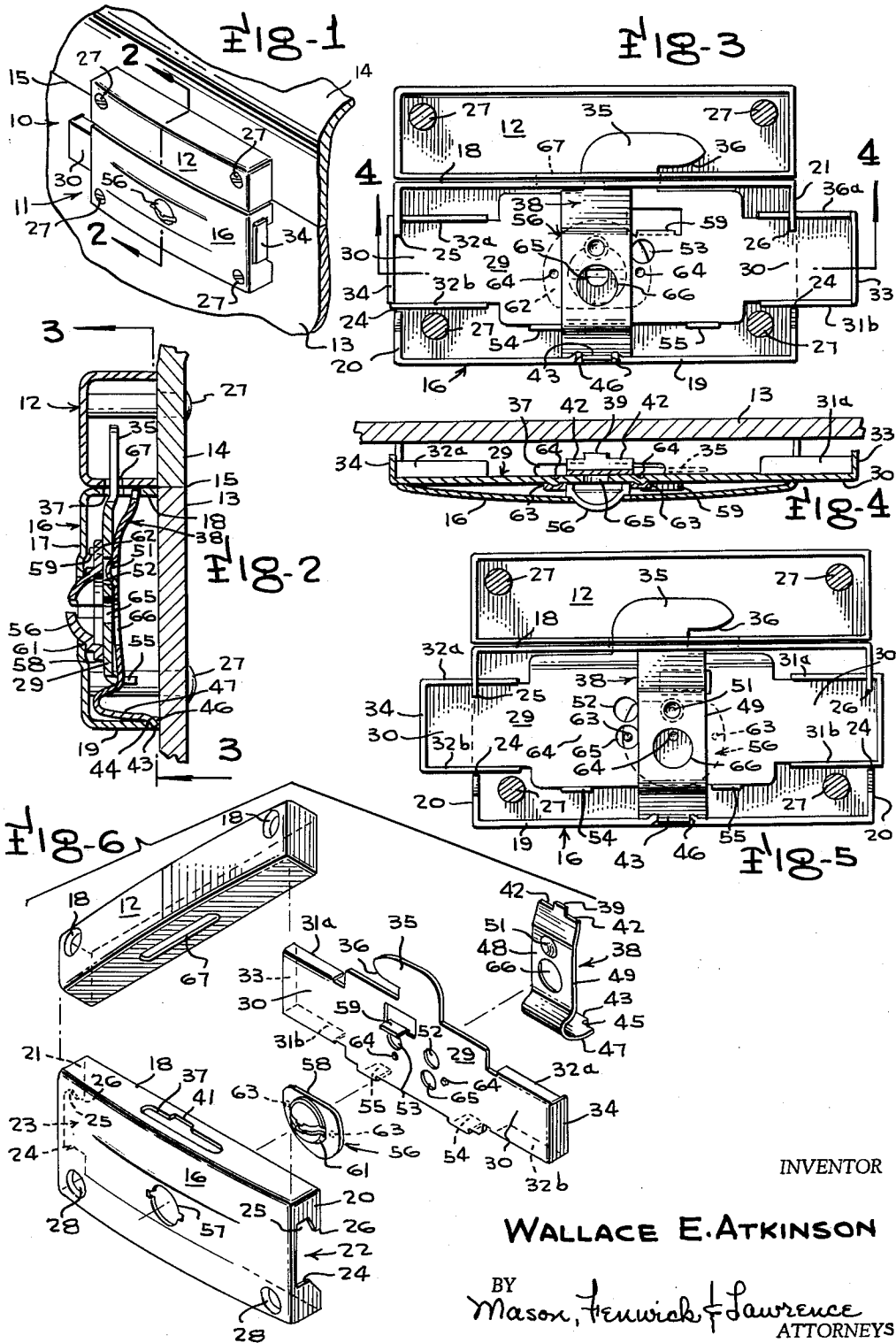
April 12, 1966

W. E. ATKINSON

3,245,236

LATCH AND LOCK MECHANISM

Filed May 8, 1964



INVENTOR

WALLACE E. ATKINSON

BY
Mason, Fenwick & Lawrence
ATTORNEYS

1

3,245,236

LATCH AND LOCK MECHANISM

Wallace E. Atkinson, Petersburg, Va., assignor to Long Manufacturing Company, Inc., Petersburg, Va., a corporation of Virginia

Filed May 8, 1964, Ser. No. 365,881

5 Claims. (Cl. 70-71)

The invention herein relates to a combined latch and lock structure, and more particularly to a latch and lock structure especially adapted for application to containers or receptacles comprising separable parts to be releasably secured in closed relation.

Combined latch and lock structures of previously known devices having a laterally rectilinearly movable latching member, of which the instant invention concerns, usually had a large number of parts that required a relatively high degree of skill to assemble and which needed certain machinery or mechanical jigs to assist the assembly. Both the large number of parts used in the previous devices and the machinery needed to assemble the previous latch and lock structure of the same general category herein described produced a structure of rather high cost. It is apparent that if a high percentage decrease in the number of parts used in the manufacture of the structure is made possible then the latch and lock structure could be made at a considerable cost saving. Further, a considerable decrease in capital outlay could be achieved if the assembly jigs could be done away with or kept down to simply hand tools.

Therefore, an object of the present invention is the provision of a combined latch and lock structure which is extremely simple, of few parts, compact in construction, attractive in appearance, reliable in operation and capable of manufacture in an economical manner.

Another object of the present invention is the provision of a combined latch and lock structure having key lock facilities therein which is adapted to be affixed to one of the separable parts of a receptacle and operative to releasably engage a keeper section that is adapted to be affixed to the other separable parts of the receptacle and includes a laterally rectilinearly movable internal latching member disposed within an external covering member while yet being operable externally of the covering member.

Another object of this invention is the provision of a combined latch and lock structure which uses a key-stone spring member to yieldingly retain the movable internal latching member and a combination key barrel and lock bolt in operative position.

Other objects, advantages and capabilities of the invention will become apparent from the following description, taken in conjunction with the accompanying drawings showing only a preferred embodiment of the invention.

In the drawings:

FIGURE 1 is a front perspective view of a combined latch and lock structure constructed in accordance with the present invention, shown in latching condition of a portion of a receptacle;

FIGURE 2 is a vertical transverse section view thereof, taken along lines 2-2 of FIGURE 1;

FIGURE 3 is a vertical longitudinal section view of the combined latch and lock structure taken along the plane indicated by lines 3-3 of FIGURE 2 showing the parts in latched position;

FIGURE 4 is a horizontal longitudinal section view taken along lines 4-4 of FIGURE 3;

FIGURE 5 is a section view taken along the same plane as FIGURE 3 but showing the parts in unlatched position; and

2

FIGURE 6 is an exploded perspective view of the combined latch and lock structure.

Referring to the drawings wherein like reference characters designate corresponding parts throughout the several figures. The combined latch and lock structure of the present invention is indicated generally by the reference character 10 and comprises two general sub assemblies or sections which may be called the latching section 11 and the keeper section 12. The latching section 11 is mounted on the front wall of a lower receptacle body or tray portion 13 and the keeper section 12 is mounted on the front wall of a separable receptacle cover 14 which is usually hinged to the body portion 13. The plane of separation between the receptacle body 13 and cover 14 is indicated by the reference character 15.

The latching section 11 comprises a stationary front cover plate 16 which may be conveniently stamped from suitable sheet metal having a front wall 17, upper and lower horizontal inwardly extending flanges 18, 19 forming top and bottom horizontal wall members and vertical flanges 20, 21 forming vertical end wall members. The vertical end walls 20, 21 are cut away in the mid portion thereof to form slide recesses 22, 23 for a purpose to be later described. The slide recesses 22, 23 comprise bearing surfaces 24, upper guide recesses 25 and guide lugs 26, projecting downwardly from the upper portion of the vertical end walls 20, 21 into the slide recesses 22, 23. It is anticipated that the cover plate 16 will be fixedly secured to the tray portion 13 by suitable fasteners 27 inserted through fastening apertures 28 in the forward front wall 17 of the cover plate and terminating rearwardly of the front wall of the tray portion 13.

The internal latching bar 29 is mounted within cover plate 16 and intimately associated with slide recesses 22, 23 for laterally reciprocative sliding movement relative thereto. Latching bar 29 is stamped from sheet metal to provide a relatively flat member having side extensions 30 having upper and lower horizontal inwardly extending flanges 31a, 31b and 32a, 32b as indicated in the drawing, and vertical flanges 33, 34 which extend inwardly a greater distance than the horizontal flanges to provide a sufficiently large surface to permit a persons finger to rest thereagainst in order that pressure may be applied to the extensions 30 to move the latching bar 29 in a sufficiently large surface to permit a person's finger to ly from the topmost part of the center portion of latching bar 29 is a catch tongue 35 having a catch shoulder 36 to form the working hook that is designed to be slidably engaged with keeper section 12 when it is desired to operate the latch portion of the present invention. The catch tongue 35 is lightly offset rearwardly of the main body of latching bar 29 so that when rested within cover plate 16, the catch tongue 35 projects upwardly and through lower interlock slot 37 and is slidable throughout the length of the slot. The slide recesses 22, 23 are so designed as to receive the latch bar 29 in a snap acting relationship wherein, when catch tongue 35 is placed into the rearward portion cover plate 16 and projected through the lower interlock slot 37 the extensions 30, and more particularly the upper horizontal flanges 31a and 32a rest within the upper guide recesses 25 and are pressed against guide lugs 26. Upon applying pressure to the center portion of the rear bottom face of latching bar 29 the entire latching bar 29 is shoved both upwardly and forwardly and snaps into slide recesses 22, 23 due to the downward pressure exerted upon horizontal extension flanges 31a and 32a by the lugs 26. In normal reciprocative sliding movement the lower extension horizontal flanges 31b, 32b rest upon bearing surfaces 24 which provide complete support for latching bar 29.

A substantially L-shaped leaf retainer spring 38 lies

against the rear wall of the latching bar 29 to constitute the sole holding force to retain the entire latching section 11 in assembled relation and to permit latching bar 29 to be relatively slidable with respect to cover plate 16. The retainer spring 38 is retained in operative position by inserting top retaining tab 39 into the top retaining notch 41 of cover plate 16 and allowing top spring shoulders 42 to engage the underside of flange 18. The bottom of retainer spring 38 is held in position by placing the bottom retaining tab 43 in the bottom retaining notch 44 and allowing bottom spring shoulders 45 to engage bottom retaining lugs 46. By such a placement of spring 38 it is seen that the short leg 47 of the L resiliently bears against flange 19 and operates to keep the spring in position, and the mid portion 48 of the long leg 49 resiliently presses against the rear face of latching bar 29 as was mentioned above. Near the top of mid portion 48, and projecting toward latching bar 29, is located a detent 51 that is adapted to register in either detent socket 52 or detent socket 53 depending on whether the bar 29 is in the latch "closed" or latch "open" position. From FIGURE 5 it can be seen that if bar 29 is in latch "open" position then detent 51 will register with socket 53 and restrain latch bar 29 from accidentally being moved to the "closed" position. In addition to the detent 51 for limiting the movement of latch bar 29, there are provided limit lugs 54, 55 projecting horizontally rearwardly of the bottom of latch bar 29 a sufficient distance to encompass the vertical plane in which the mid portion 48 lies so that when the latch bar 29 is laterally reciprocated the desired distance the spring 38 will engage the limit lugs 54, 55 and prevent further movement of the latch bar 29.

To effect key locking of the internal latching bar 29, a single one piece locking mechanism in the form of a disc-like combination key barrel and bolt 56 is supported for rotation about its central axis in the circular opening 57 of the front wall 17 of cover plate 16. The combination key barrel and bolt 56 is in the form of a truncated disc cut along a chord to produce a flat 58 which lies in a horizontal plane just below the plane of the horizontal frontally projecting locking lug 59 when the mechanism of the present invention is in the latch "open" position. In such a position, the combination key barrel and bolt 56 allows the latch bar 29 free lateral reciprocative movement as the locking lug 59 is free to move over flat 58 in an unrestricted manner. The truncated disk form of the combination key barrel and bolt 56 has a projecting mid portion forming a stepped truncated cone in which the step, or bearing surface 61, bears directly against the rear of front wall 17 and about the peripheral edge of opening 57 to provide a bearing surface. The rear face 62 is pressed against the front face of latch bar 29 which in turn retains bolt 56 in the correct operative position in opening 57. Within the rear face 62 are indentations or sockets 63 that are adapted to register with detents 64 in latch bar 29 in the "closed" or lock position. Aperture 65 in latch bar 29 and aperture 66 in spring 38 are designed to provide a center of rotation for a suitable key that may be inserted into the combination key barrel and lock bolt 56.

In operation it will be apparent that when a key is inserted into the combination barrel and lock bolt 56 and rotated to align the flat 58 of the key barrel and lock bolt 56 in parallelism with locking lug 59, the latching bar 29 is then freed for movement in a lateral reciprocative manner. The position of the latching bar 29 in the latch "open" position, as illustrated in FIGURE 5, shows the flat 58 and locking lug 59 in relative positions that allow latching bar 29 to pass freely to the "open" position. When the latching bar 29 is in the position shown in FIGURE 5 the catch tongue 35 is in alignment with lower interlock slot 37 and keeper interlock slot 67 so that the catch tongue 35 may freely pass through the interlock slots 37 and 67 and may be withdrawn therefrom upon opening of the receptacle cover 14.

When the receptacle cover 14 is lowered to "closed" position relative to the tray portion 13 the latching bar 29 may then be shifted laterally to the locking position illustrated in FIGURE 3 which effects interlocking of catch tongue 35 and the keeper section 12 to prevent relative opening movement of the two receptacle parts. Rotation of the combination key barrel and lock bolt 56 by the key to bring an uninterrupted portion of the truncated disc across the path of movement of locking lug 59, as shown in FIGURE 3, effectively locks the latching bar 29 against displacement from the latch "closed" position and prevents both the receptacle cover 14 from being opened and latching bar 29 from being laterally reciprocated to the latch "open" position. It should be further noted that the only time that the key may be inserted into the combination key barrel and lock bar 56 is when the latching bar 29 is in the latch "closed" position, as shown in FIGURE 3, since this is the only time that apertures 65 and 66 are in registry with one another and with key barrel and lock bolt 56 to allow a key to be passed therethrough for permitting a center of rotation for the key. If the latching bar 29 is in a latch "open" position, as shown by FIGURE 5, then apertures 65, 66 are not in registry with one another or key barrel and lock bolt 56 and a key is prevented from being inserted into the lock a sufficient distance to operate combination key barrel and lock bolt 56.

While I have particularly shown and described one particular embodiment of the invention, it is distinctly understood that the invention is not limited thereto but that modifications may be made within the scope of the invention and such variations as are covered by the scope of the appended claims.

What is claimed is:

1. An easily assembled latch for releasably securing together separable parts of a receptacle adjacent a line of separation along coplanar front surfaces of the parts comprising an elongated rearwardly opening cover having at least one aperture therein and adapted to be affixed to one of the front surfaces, the cover having a front wall spaced from the associated front surface and in parallelism therewith and the longitudinal axis of the cover in parallelism with the line of separation, the cover having rearwardly projecting upper and lower longitudinal and transverse marginal flanges relative to the front surface, an elongated latching member disposed in the cover, the latching member having a length greater than the longitudinal length of the cover to accommodate movement of the latching member parallel to the longitudinal axis of the cover from a latching position to a release position and a width transversely of the longitudinal axis of the cover less than the width of the cover, means mounting the latching member in the cover for rectilinear reciprocative movement along the longitudinal axis, resilient means disposed adjacent the latching member and providing biasing force for retaining the latching member in operative position, the resilient means having an upwardly projecting leg portion and a rearwardly projecting leg portion, each leg portion having a boss member extending therefrom, the upper and lower longitudinal marginal edges of the cover having boss recesses adapted to receive in snap fitting relation an upwardly projecting leg boss and a rearwardly projecting leg boss respectively, the latching member adapted to interlock with keeper means affixed to the other receptacle part whereby longitudinal movement of the latching member from the release position to the latching position being operative to interlock the latching member with the keeper means.

2. An easily assembled latch for releasably securing together separable parts of a receptacle adjacent a line of separation along the coplanar front surfaces of the parts comprising an elongated rearwardly opening cover having at least one aperture therein and adapted to be affixed to one of the front surfaces, the cover having a front wall spaced from the associated front surface and

5

in parallelism therewith and the longitudinal axis of the cover in parallelism with the line of separation, the cover having rearwardly projecting upper and lower longitudinal and transverse marginal flanges relative to the front surface, an elongated latching member disposed in the cover, the latching member having a length greater than the longitudinal length of the cover to accommodate movement of the latching member parallel to the longitudinal axis of the cover from a latching position to a release position and a width transversely of the longitudinal axis of the cover less than the width of the cover, means mounting the latching member in the cover for rectilinear reciprocative movement along the longitudinal axis, resilient means for retaining the latching member in operative position, the resilient means having an upwardly projecting leg portion and a rearwardly projecting leg portion, each leg portion having a boss member extending therefrom, the upper and lower longitudinal marginal edges of the cover having boss recesses adapted to receive in snap fitting relation an upwardly projecting leg boss and a rearwardly projecting leg boss respectively, the upwardly projecting leg portion biasing the latching member into sliding contact with the cover, said resilient means providing the sole force retaining the latching member in operative relation with the cover, the latching member adapted to interlock with keeper means affixed to the other receptacle part whereby longitudinal movement of the latching member from the release position to the latching position being operative to interlock the latching member with the keeper means.

3. A latch for releasably securing together separable parts of a receptacle adjacent a line of separation along coplanar front surfaces of the parts comprising an elongated rearwardly opening cover having at least one aperture therein and adapted to be affixed to one of the front surfaces, the cover having a front wall spaced from the associated front surface and in parallelism therewith and the longitudinal axis of the cover in parallelism with the line of separation, an elongated latching member disposed in the cover having a front wall and a rear wall, the latching member having a length greater than the longitudinal length of the cover to accommodate movement of the latching member parallel to the longitudinal axis of the cover from a latching position to a release position and a width transversely of the longitudinal axis of the cover less than the width of the cover, means mounting the latching member in the cover for rectilinear reciprocative movement along the longitudinal axis, locking means comprising a combination key barrel and lock bolt having a disc-like configuration truncated along a chord with one side having a protruding stepped truncated cone center portion for rotation within the aperture of the cover, the other side of the combination key barrel and lock bolt adapted to bear slidably against the front wall of the latching member, a horizontal lug projecting forwardly from the front wall of the latching member for cooperation with the disc-like portion of the locking means to prevent rectilinear reciprocative movement of the latching member and when an uninterrupted portion of the locking means lies across the path of the projecting lug and to permit rectilinear reciprocative movement of the latching member when an interrupted portion of the disc lies parallel with and below the path of the projecting lug, resilient means for retaining the latching member in operative position, a hollow elongated keeper member having a length corresponding to the longitudinal dimension of the cover adapted to be affixed to the front surface of the other receptacle part adjacent the line of separation, means in the keeper member for effecting interlocking of the latching member and the keeper member, whereby longitudinal movement of the latching member from the release position to the latching position being operative to interlock the latching member with the keeper member.

4. A latch for releasably securing together separable

6

parts of a receptacle adjacent a line of separation along coplanar front surfaces of the parts comprising an elongated rearwardly opening cover having at least one aperture therein and adapted to be affixed to one of the front surfaces, the cover having a front wall spaced from the associated front surface and in parallelism therewith and the longitudinal axis of the cover in parallelism with the line of separation, the cover having rearwardly projecting longitudinal and transverse marginal flanges relative to the front surface, an elongated latching member disposed in the cover having a front wall and a rear wall, the latching member having a length greater than the longitudinal length of the cover to accommodate movement of the latching member parallel to the longitudinal axis of the cover from a latching position to a release position and a width transversely of the longitudinal axis of the cover less than the width of the cover, means mounting the latching member in the cover for rectilinear reciprocative movement along the longitudinal axis, locking means comprising a combination key barrel and lock bolt having a disc-like configuration truncated along a chord with one side having a protruding stepped truncated cone center portion for rotation within the aperture of the cover, the other side of the combination key barrel and lock bolt adapted to bear slidably against the front wall of the latching member, a horizontal lug projecting forwardly from the front wall of the latching member for cooperation with the disc-like portion of the locking means to prevent rectilinear reciprocative movement of the latching member when an uninterrupted portion of the locking means lies across the path of the projecting lug and to permit rectilinear reciprocative movement of the latching member when an interrupted portion of the disc lies parallel with and below the path of the projecting lug, a substantially L shaped leaf retainer spring spanning the longitudinal marginal flanges of the cover for retaining the latching member and locking means in operative position including means securing the ends of the spring in the longitudinal marginal flanges of the cover to position the spring adjacent the rear wall of the latching member, a hollow elongated keeper member having a length corresponding to the longitudinal dimension of the cover adapted to be affixed to the front surface of the other receptacle part adjacent the line of separation, means in the keeper member for effecting interlocking of the latching member and the keeper member, whereby longitudinal movement of the latching member from the release position to the latching position being operative to interlock the latching member with the keeper member.

5. A latch for releasably securing together separable parts of a receptacle adjacent a line of separation along coplanar front surfaces of the parts comprising an elongated rearwardly opening cover having at least one aperture therein and adapted to be affixed to one of the front surfaces, the cover having a front wall spaced from the associated front surface and in parallelism therewith the longitudinal axis of the cover in parallelism with the line of separation, the cover having rearwardly projecting longitudinal and transverse marginal flanges relative to the front surface, an elongated interlock slot in a longitudinal marginal flange of the cover, an elongated latching member disposed in the cover having a front wall and a rear wall, the latching member having a length greater than the longitudinal length of the cover to accommodate movement of the latching member parallel to the longitudinal axis of the cover from a latching position to a release position and a width transversely of the longitudinal axis of the cover less than the width of the cover, the latching member including a latching tongue of hook-shaped configuration extending across the line of separation to overlie the front surface of the other receptacle part, the latching tongue having a nose portion projecting parallel to the longitudinal axis, means mounting the latching member in the cover for rectilinear reciprocative movement along the longitudinal axis includ-

ing elongated guide slots in the transverse marginal flanges of the cover to provide bearing surfaces for the latching member to be nested therein and project there-through, locking means comprising a combination key barrel and lock bolt having a disc-like configuration 5 truncated along a chord with one side having a protruding stepped truncated cone center portion for rotation within the aperture of the cover, the other side of the combination key barrel and lock bolt adapted to bear slidably against the front wall of the latching member, a 10 horizontal lug projecting forwardly from the front wall of the latching member for cooperation with the disc-like portion of the locking means to prevent rectilinear reciprocative movement of the latching member when an uninterrupted portion of the locking means lies across 15 the path of the projecting lug and to permit rectilinear reciprocative movement of the latching member when an interrupted portion of the disc lies parallel with and below the path of the projecting lug, a substantially L shaped leaf retainer spring spanning the longitudinal 20 marginal flanges of the cover for retaining the latching member and locking means in operative position including means securing the ends of the spring in the longitudinal marginal flanges of the cover to position the spring adjacent the rear wall of the latching member, a 25 hollow elongated keeper member having a length corresponding to the longitudinal dimension of the cover

adapted to be affixed to the front surface of the other receptacle part adjacent the line of separation, the keeper member having a rearwardly opening channel-shaped configuration, the keeper member having an interlock slot in a flange portion of the keeper member in registry with the interlock slot of the cover to accommodate insertion and withdrawal of the latching tongue there-through when the latching member is in the release position, whereby longitudinal movement of the latching member from the release position to the latching position being operative to interlock the latching member with the keeper member.

References Cited by the Examiner

UNITED STATES PATENTS

1,323,709	12/1919	Madunicky	70—71
2,819,603	1/1958	Levine	70—74
3,103,114	9/1963	Atkinson	70—71
3,186,197	6/1965	Gehrie	70—71

FOREIGN PATENTS

578,616 5/1933 Germany.

25 JOSEPH D. SEERS, *Primary Examiner*.

BOBBY R. GAY, *Examiner*.