

April 29, 1969

W. J. DOYLE

3,441,269

LATCH BOLT MECHANISM

Filed Oct. 31, 1966

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FIG. 1.

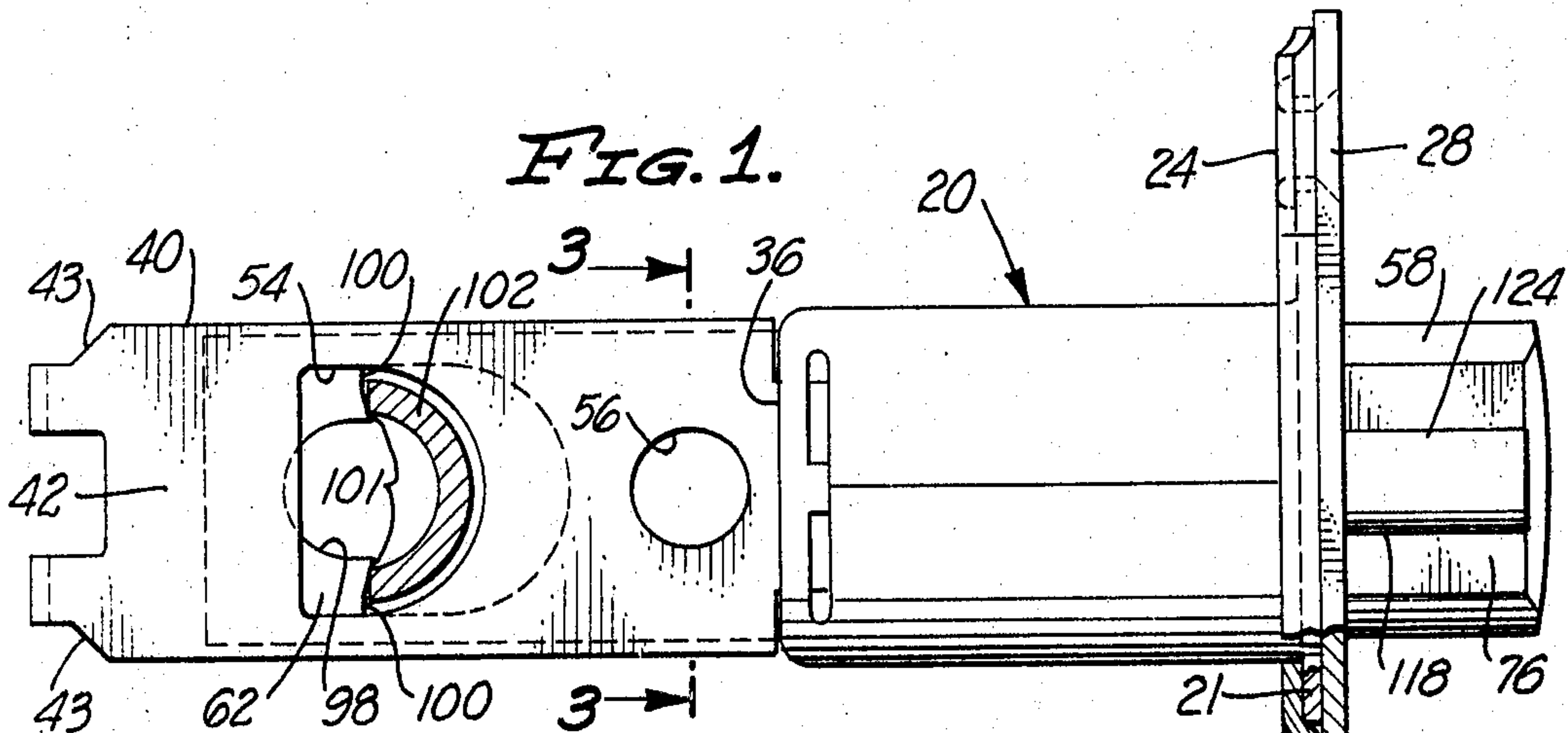


FIG. 2.

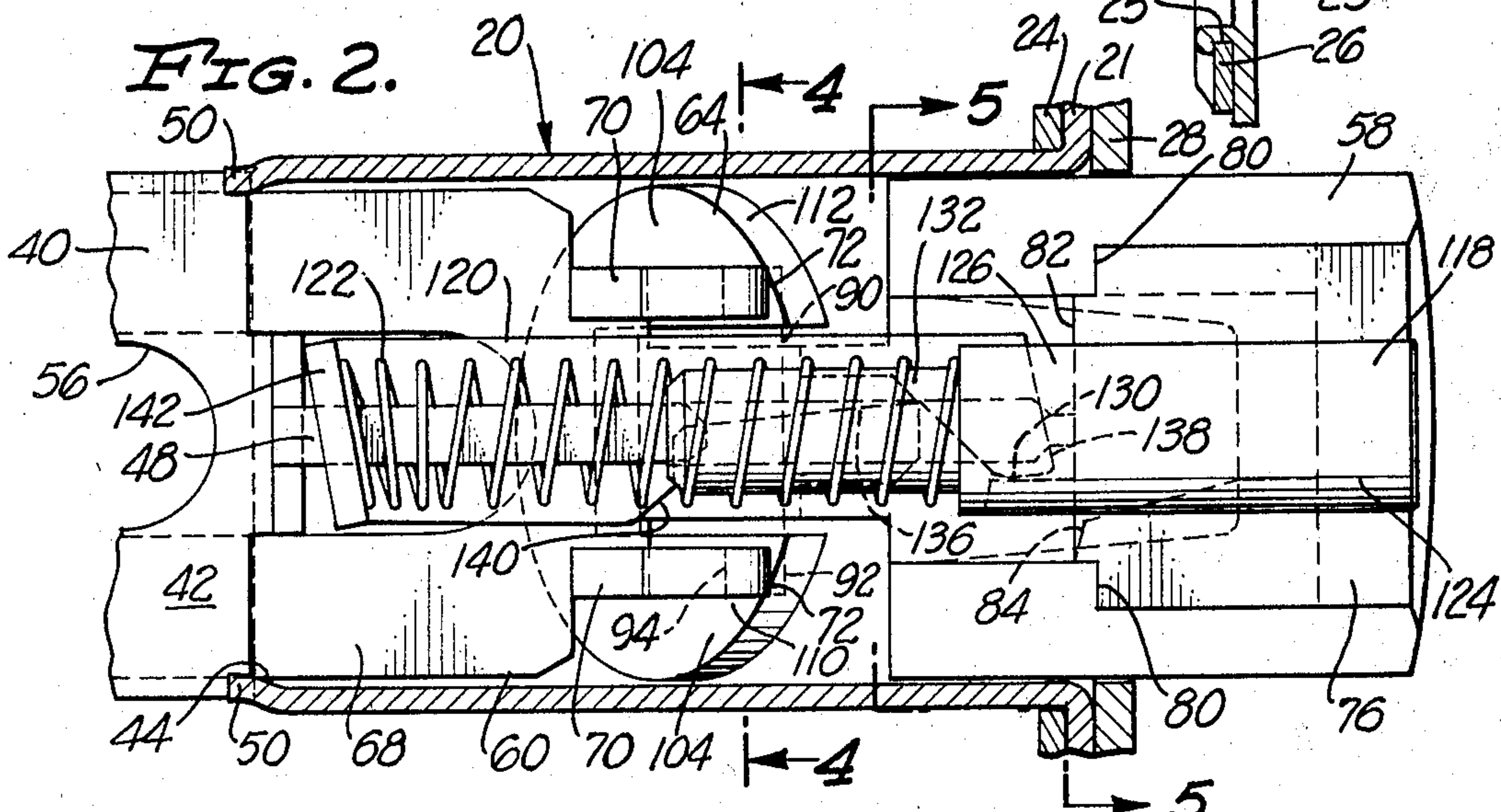


FIG. 4.

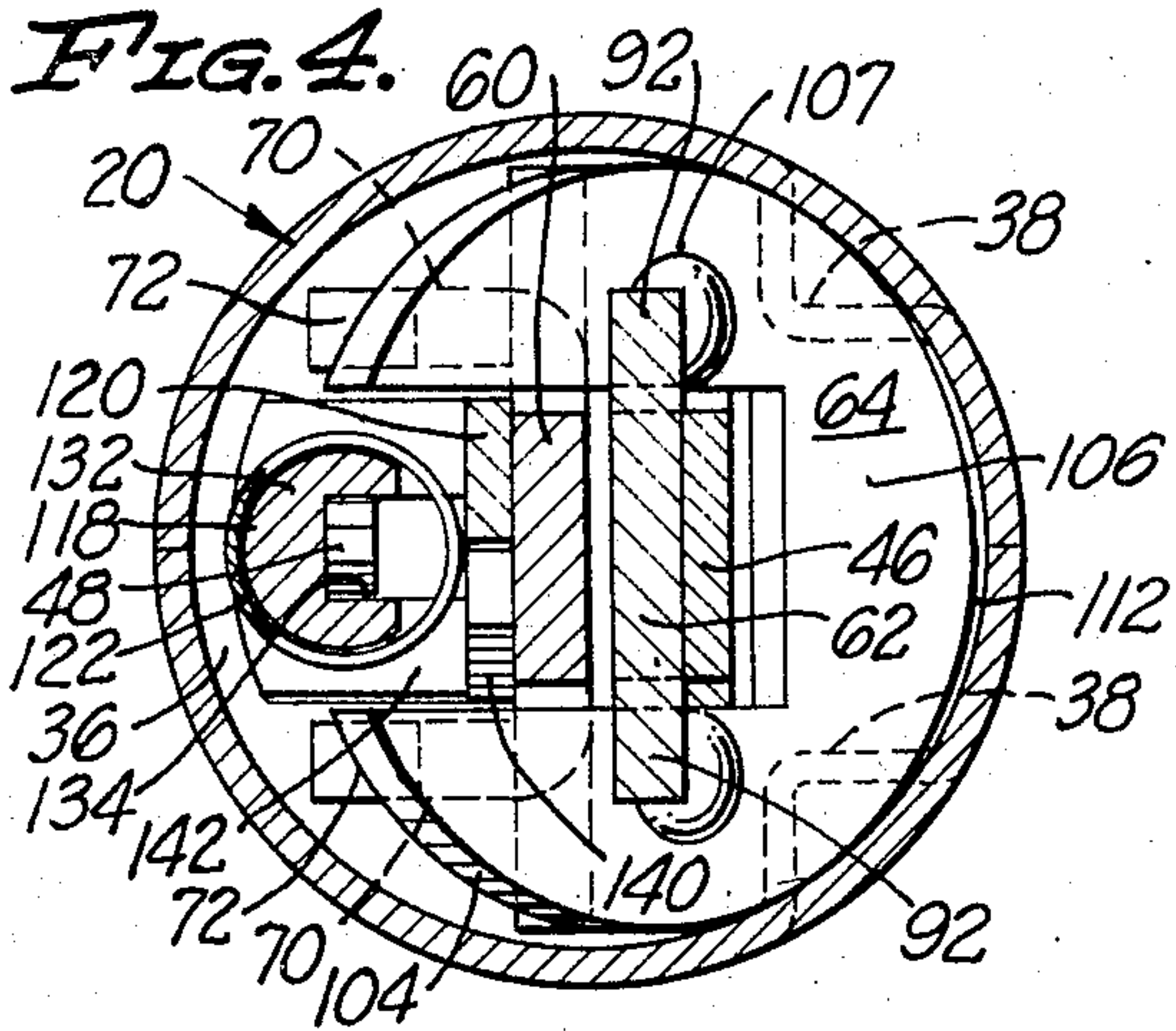
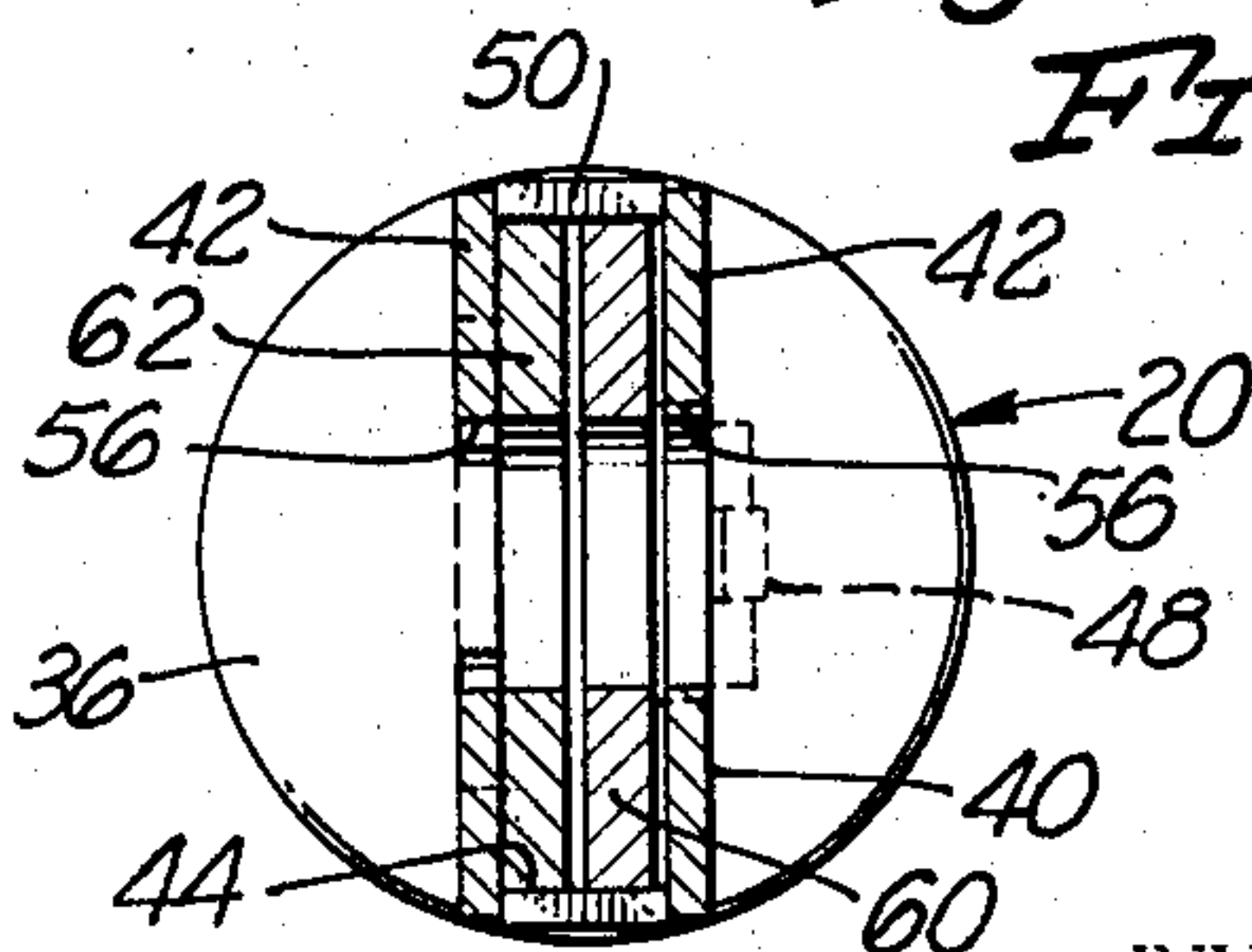


FIG. 3.



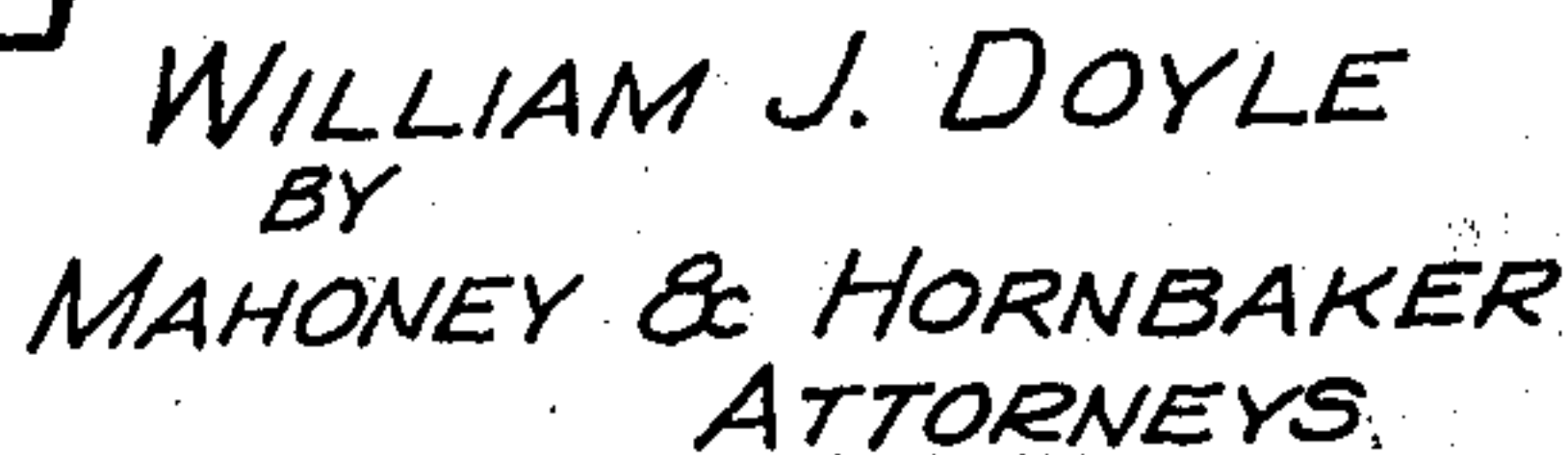
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LATCH-BOLT MECHANISM

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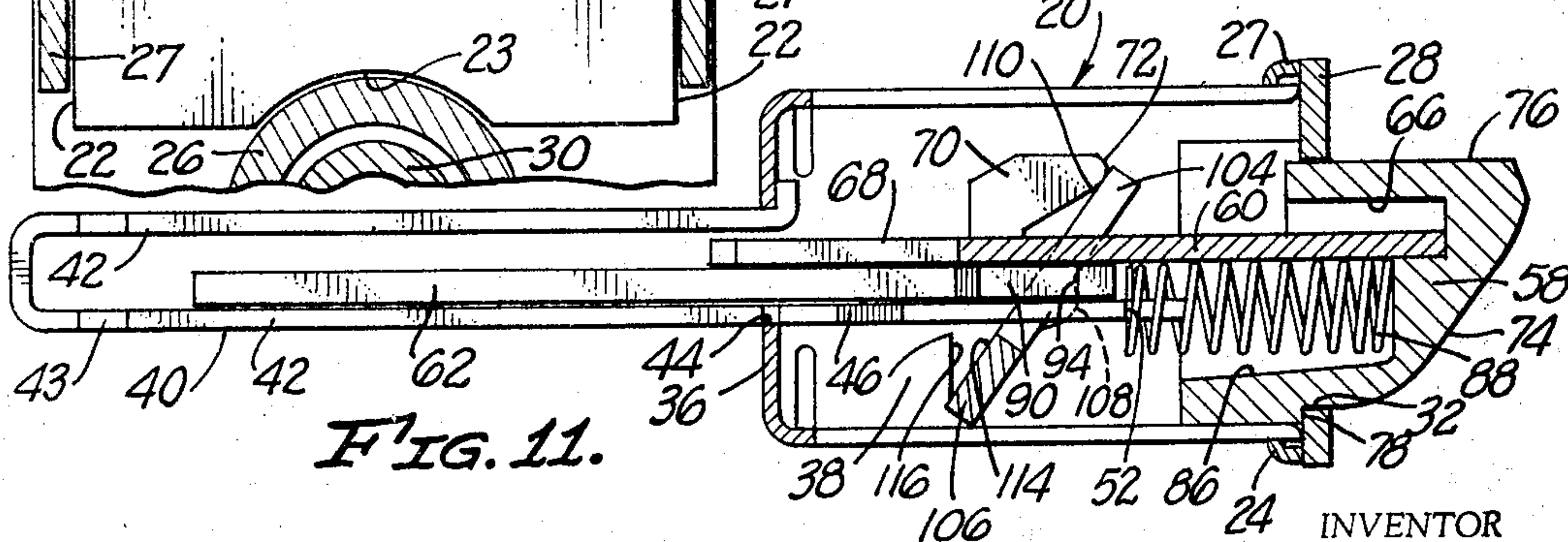
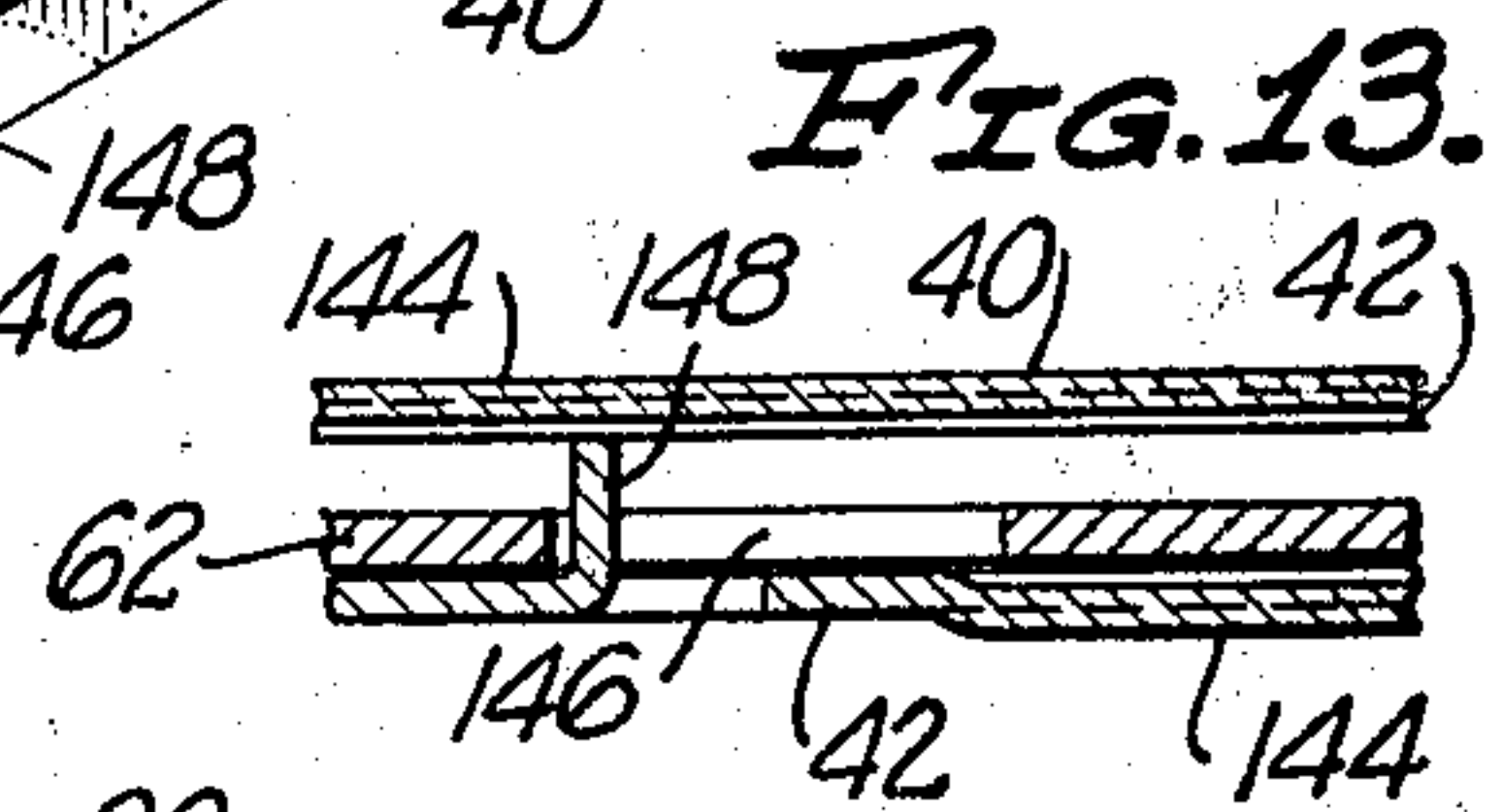
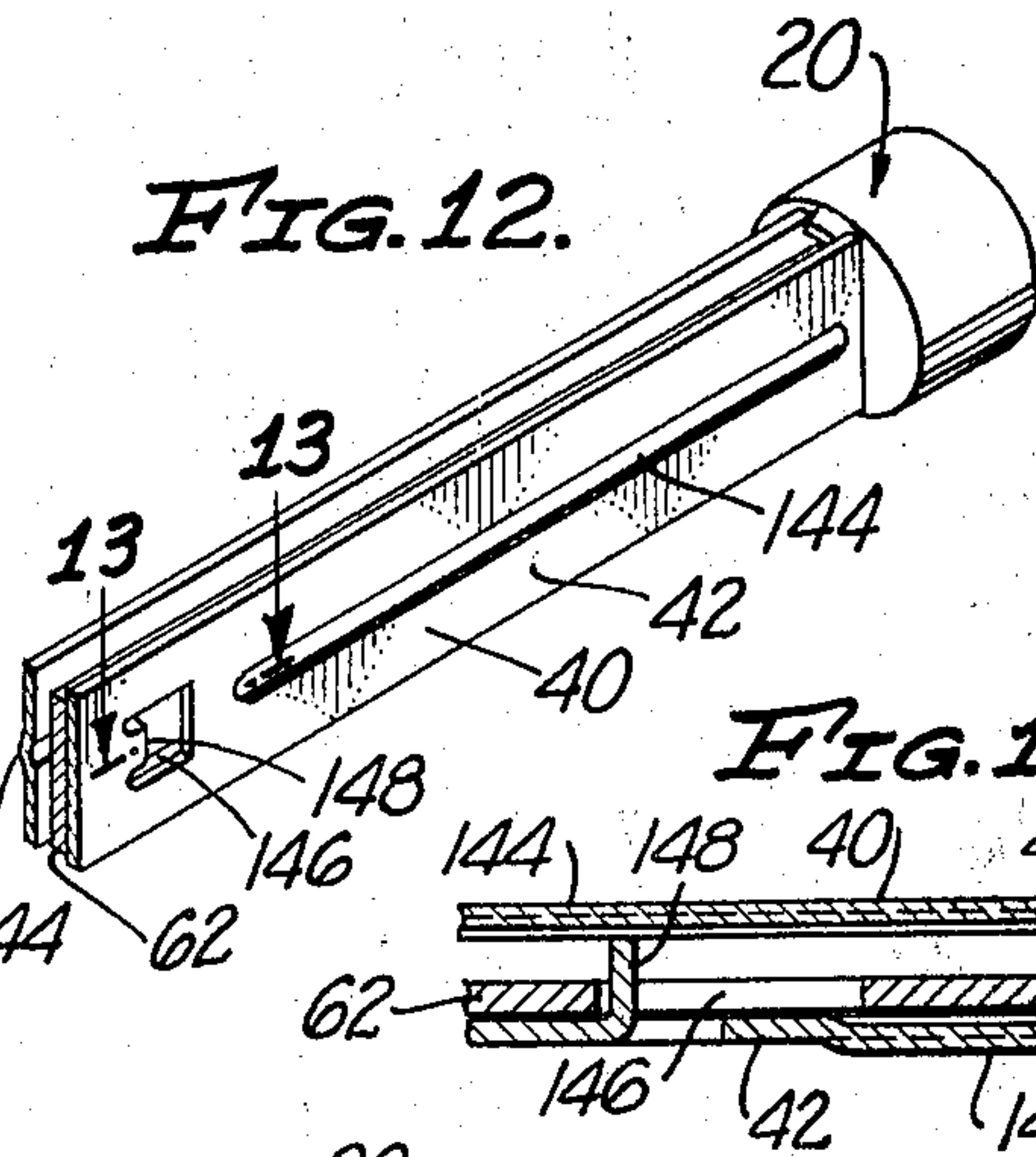
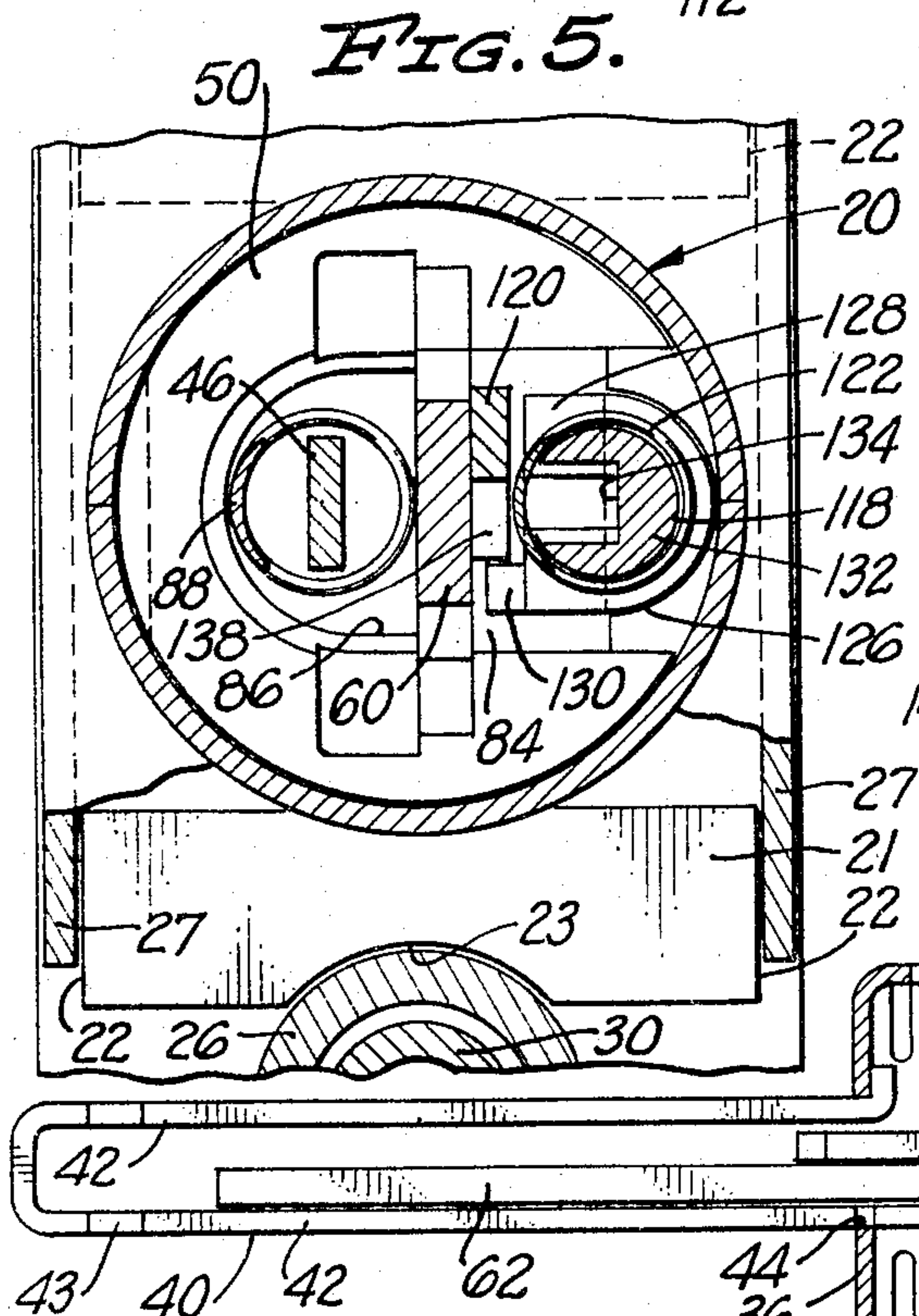
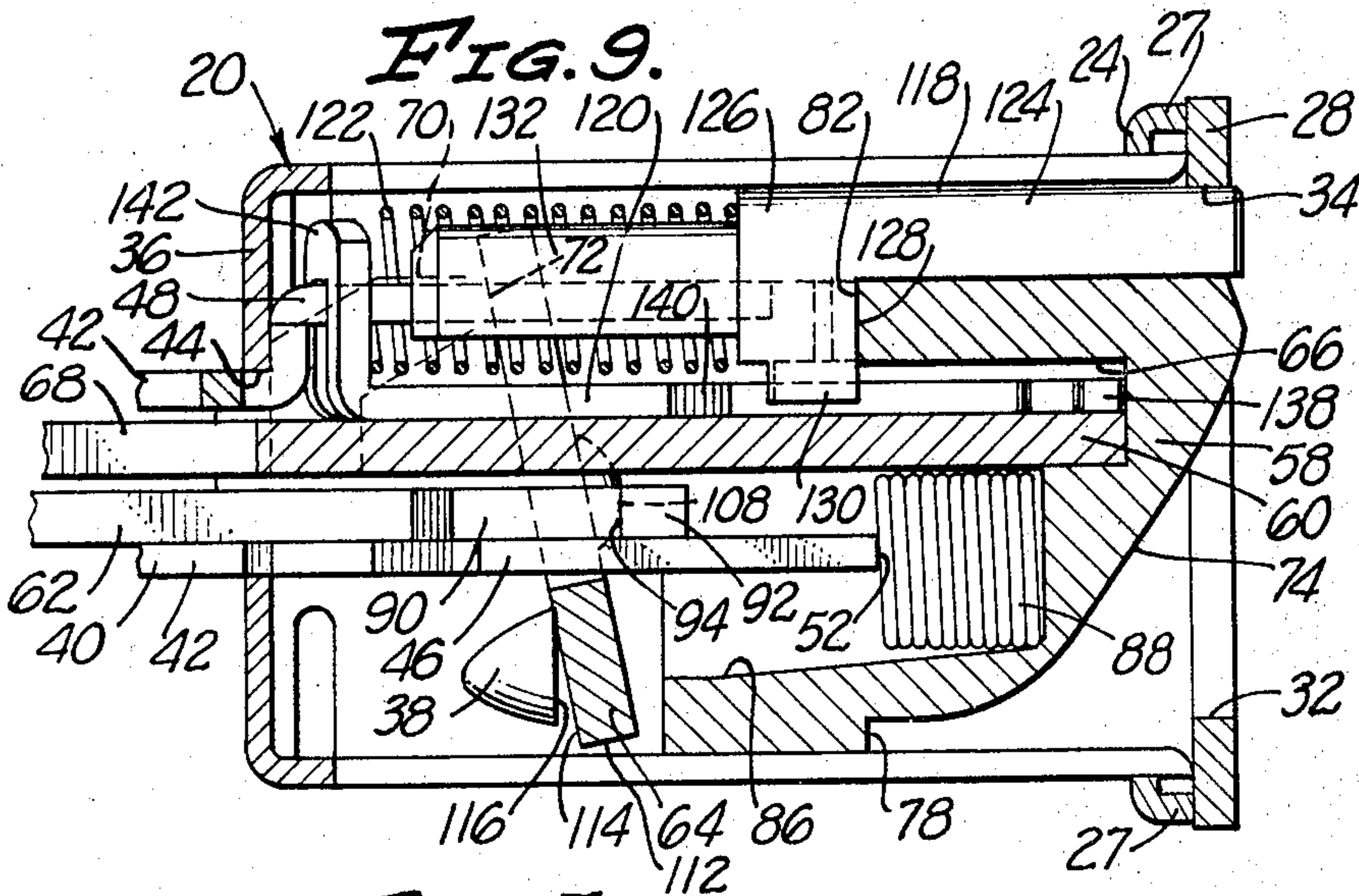
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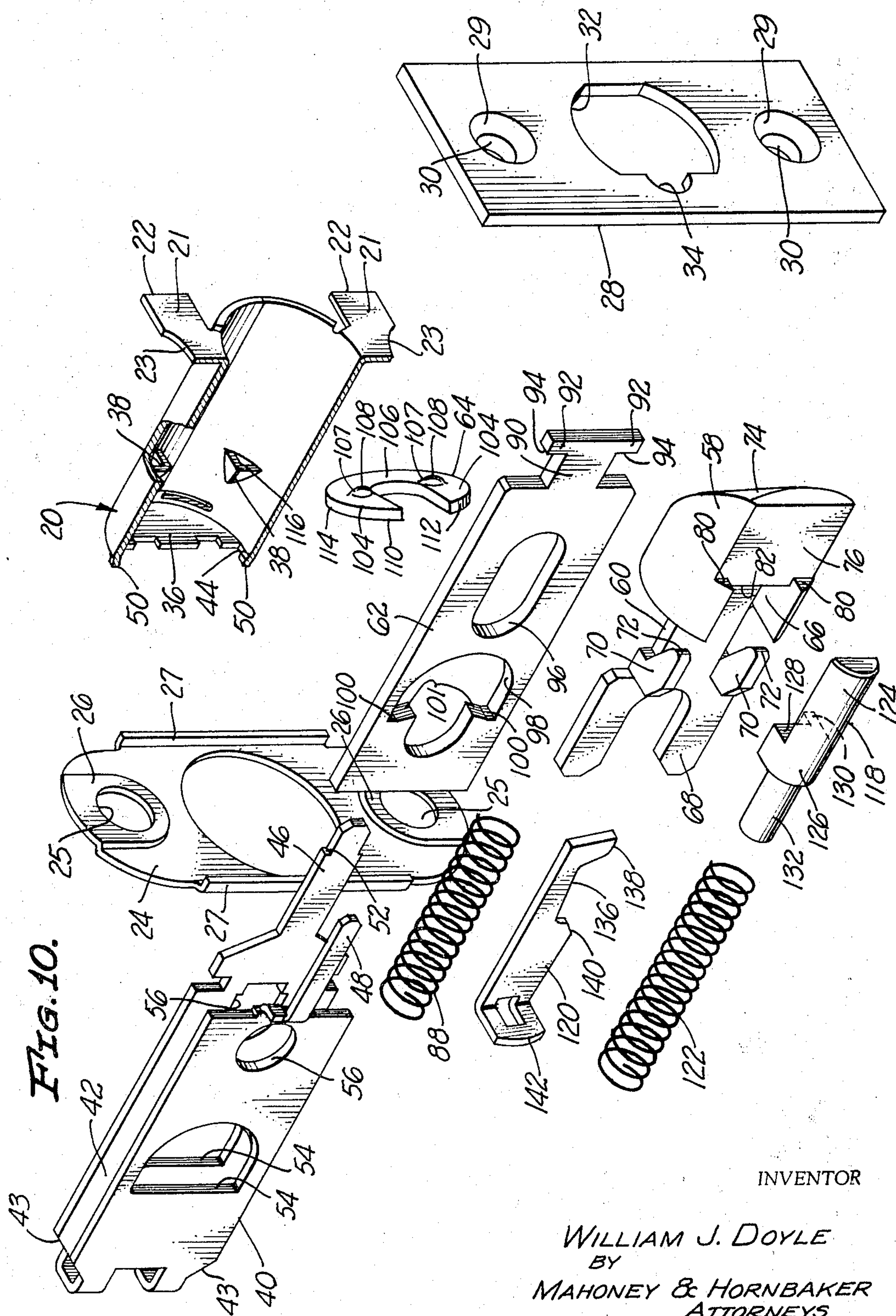
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LATCH BOLT MECHANISM

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U.S. Cl. 292—165

12 Claims

ABSTRACT OF THE DISCLOSURE

A case has a latch bolt forwardly and rearwardly longitudinally movable therein and a rearward case extension having laterally spaced side plates laterally enclosing a retractor slide connected for moving the bolt. A somewhat flat, U-shaped retractor lever extends laterally of the case connecting the bolt and slide for said movement, said lever rearwardly abutting forwardly facing surfaces of the bolt and having bulges forwardly abutting rearwardly facing surfaces of the slide so as to translate movement of the slide into movement of the bolt through lever pivoting. A rollback pivotally engages sloping cam surfaces of the retractor slide to move the bolt and slide, and the case extension side plates are maintained stiff and laterally spaced through special reinforcing ribs and tabs permitting said slide movement.

This invention relates to a latch bolt mechanism and, more particularly, to a latch bolt mechanism incorporating a main latch bolt and a retractor slide for operating said main latch bolt, with a unique form of retractor lever co-operating in a particular manner between the bolt and slide for accomplishing movement of the bolt by the slide. Furthermore, this invention relates to a latch bolt mechanism which may incorporate a unique form of floating case faceplate, a unique form of case extension projecting rearwardly of the case having special strengthening means associated therewith, and a unique form of retractor slide particularly adapted to provide positive latch bolt movement.

Many prior forms of latch bolt mechanism have been provided, certain of which have included a dead latch bolt arranged in co-operation with the main latch bolt for blocking this main bolt in an extended position under certain conditions so that the main bolt cannot be forced to retracted position by instruments acting directly on the main bolt. Furthermore, this blocking of the main bolt is usually accomplished by some form of dead latch lever or dog which is moved into main bolt blocking position when the dead latch bolt is retracted while the main bolt remains extended, a usual case being when the latch bolt mechanism is mounted in a door and the door is closed.

At the same time, where this dead latch bolt and blocking dog are provided, the retraction means for the main latch bolt must be arranged for moving the dead latch dog out of main bolt blocking position as the main bolt is retracted by this retraction means. In this manner, although the main latch bolt cannot be forced to retracted position by an outside force against the main bolt, the main bolt can be withdrawn or retracted by the usual manipulation of the retraction means, such as by turning the door-knob for disengaging the main bolt and opening the door.

Thus, although the construction of latch bolt mechanisms might seem relatively simple to one not completely familiar with such mechanisms, in reality, the required movements of the various parts thereof must be relatively complex. As a result thereof, most of the prior forms of latch bolt mechanisms have been quite complicated and expensive to provide, and in many cases, these prior mechanisms have not always been positively operable.

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It is, therefore, an object of my invention to provide a latch bolt mechanism which is greatly simplified over the prior constructions, may be provided at a lesser cost of material and labor and is positively operable so as to function in a virtually fool-proof manner. Simplicity has been obtained in the latch bolt mechanism of the present invention by the use of unique integral projections formed directly from the case of the mechanism for directly mounting and guiding the main and dead latch bolts and the springs therefor, as well as directly, movably mounting the dead latch dog. Furthermore, the means providing the operable connection between the main latch bolt and the retraction means therefor serves directly as the means for withdrawing the dead latch dog from main bolt blocking position during normal operation of the main bolt retraction means so that not only is maximum simplicity provided, but positive operation is absolutely required.

It is a further object of my invention to provide a latch bolt mechanism having a main latch bolt operable between extended and retracted positions through a retractor slide in which the operable connection between the bolt and slide is of a unique and positively operable form. According to the present invention, this connection may consist of merely a separate, one-piece retractor lever which pivots longitudinally over projections which may be formed directly on the case and with the lever extending transversely of the case. Also, by forming this retractor lever generally U-shaped, abutment surfaces may be formed on each of the legs thereof for providing longitudinal abutment with each leg between this lever and each of the main latch bolt and retractor slide for the operable connection therebetween.

It is still another object of my invention to provide a latch bolt mechanism of the foregoing character in which this single retractor lever may be formed to be guided directly by the case for the latch bolt mechanism so as not to require separate guiding means. The case may be formed cylindrical and the retractor lever at least partially circular in transverse cross section so that the retractor lever may abut and slide longitudinally along inner case surfaces during the longitudinal, pivotal movement of this retractor lever in the operation of the retractor slide and main latch bolt. Further, this transverse sliding abutment between the retractor lever and the case maintains the retractor lever during its longitudinal, pivotal movement properly aligned with the retractor slide and main latch bolt for proper co-action therebetween.

Other objects and advantages of the invention will be apparent from the following specification and the accompanying drawings which are for the purpose of illustration only, and in which:

FIG. 1 is a side elevational view of an embodiment of the latch bolt mechanism of the present invention, with the operable connection thereof to a usual door-knob rollback being shown in section;

FIG. 2 is an enlarged, fragmentary, side elevational view similar to FIG. 1, but with the top portion of the case removed to show internal parts;

FIG. 3 is a transverse, vertical, sectional view taken along the broken line 3—3 in FIG. 1;

FIG. 4 is a transverse, vertical, sectional view taken along the broken line 4—4 in FIG. 2;

FIG. 5 is a transverse, vertical, sectional view taken along the broken line 5—5 in FIG. 2;

FIG. 6 is a horizontal, sectional view taken through FIG. 2;

FIG. 7 is a view similar to FIG. 2, but with the dead latch bolt in retracted position, while the main latch bolt remains in extended position;

FIG. 8 is a horizontal, sectional view taken through FIG. 7;

FIG. 9 is a view similar to FIGS. 6 and 8, but with both the dead latch bolt and main latch bolt in retracted positions;

FIG. 10 is an exploded view showing the various parts of the latch bolt mechanism, with the case being shown in longitudinal, vertical section;

FIG. 11 is a horizontal, sectional view of a modified form of the latch bolt mechanism and not including the dead latch portion thereof;

FIG. 12 is a fragmentary, perspective view showing a modified form of the case extension for the latch bolt mechanism of the present invention; and

FIG. 13 is an enlarged, fragmentary, sectional view taken along the broken line 13—13 in FIG. 12.

Referring to the drawings, and particularly FIGS. 1 through 6, 10 and 11 thereof, the embodiment of the latch bolt mechanism of the present invention is shown as including a hollow, cylindrical case 20 having forward mounting flanges 21 formed projecting therefrom, with said mounting flanges being provided with generally parallel side edges 22 and oppositely disposed, arcuate clearance recesses 23. The case forward mounting flanges 21 are rearwardly enclosed by a rear faceplate 24 having mounting screw openings 25 surrounded by arcuate, forwardly recessed portions 26 and parallel, forwardly extending side flanges 27. As best seen in FIG. 5, with the rear faceplate 24 forwardly abutting the rear surfaces of the case mounting flanges 21, the forwardly recessed portions 26 of the rear faceplate are received partially in the clearance recesses 23 of the case mounting flanges and slightly spaced from these flanges, while the flange side edges 22 are laterally enclosed by the forwardly extending side flanges 27 of the rear faceplate, also slightly spaced therefrom.

Further, the case forward mounting flanges 21 are forwardly enclosed by a front faceplate 28 having mounting screw openings 29. The front faceplate 28 rearwardly abuts the forward surface of the case mounting flanges 21, with the mounting screw openings 29 of the front faceplate aligned with the mounting screw openings 25 of the rear faceplate 24. Annular, rearwardly extending extrusions 30 are formed on the front faceplate 28 around the mounting screw openings 29, with the extrusions being received through the mounting screw openings 25 of the rear faceplate 24 and being upset rearwardly of the rear faceplate, as best seen in FIG. 1, so as to secure the case 20, rear faceplate 24 and front faceplate 28 assembled as a unit.

As hereinbefore pointed out and best seen in FIG. 5, slight clearance is provided between the clearance recesses 23 of the case forward mounting flanges 21 and the forwardly recessed portions 26 of the rear faceplate 24, as well as between the side edges 22 of the case forward mounting flanges and the forwardly extending side flanges 27 of the rear faceplate. The purpose of this described clearance is to provide the case forward mounting flanges 21 slightly floating within the enclosure of the rear faceplate 24 and the front faceplate 28 so that slight misalignments between the surfaces on which the faceplates are mounted and the opening formed for receiving the case 20 therein will not disturb nor tend to separate the assembly of the case and faceplates.

The front faceplate 28 is also formed with adjoining and contoured main latch bolt opening 32 and dead bolt opening 34 longitudinally aligned with the central portion of the case 20. Furthermore, the case 20 is provided with a vertically slotted, rear wall 36 and intermediate, transversely, inwardly projecting and transversely aligned lances or abutments 38, for purposes to be hereinafter described.

A longitudinally, rearwardly projecting case extension 40 having connected, transversely spaced sideplates 42 with tapered rearward ends 43 is mounted with a forward end thereof received longitudinally forwardly through a vertical slot 44 in the case rear wall 36. A main bolt

mounting prong 46 is formed at the forward end of one of the extension sideplates 42 and a dead bolt mounting prong 48 is formed at the forward end of the other of the extension sideplates 42, with the prongs projecting forwardly into the interior of the case 20, as can be clearly seen in FIG. 6. The dead bolt mounting prong 48 is offset for inwardly, rearwardly abutting the case rear wall 36, and the extension sideplates 42 and case rear wall are formed with appropriate notches and openings for interfitting engagement when the extension sideplates are pressed together at the forward ends thereof, the prongs 46 and 48 inserted forwardly through the vertical slot 44 of the case rear wall 36 and the sideplates released to spring transversely outwardly.

After this assembly of the case 20 and case extension 40, tabs 50 may be formed inwardly on the case rear wall 36 extending inwardly between the extension sideplates 42 for retaining these sideplates spaced apart and the case and case extension in proper assembly. In this case assembly, as before pointed out in FIG. 6, main and dead bolt mounting prongs 46 and 48 project forwardly into the interior of case 20, that is, longitudinally forwardly of the case rear wall 36, and the forward end portion of the main bolt mounting prong 46 is formed with a spring seat 52. Also, the extension sideplates 42 are formed with appropriate retraction openings 54 and mounting screw openings 56.

The main latch bolt assembly includes the main latch bolt 58 having the rearwardly extending latch bolt extension 60, the retractor slide 62 which forwardly overlaps the latch bolt extension and extends rearwardly therefrom, and the unique pivotal retractor lever 64 which operably connects the latch bolt extension and retractor slide for co-action therebetween and forming an important part of the present invention. The forward end of latch bolt extension 60 is secured telescoped within the rearwardly opening clearance recess 66 of the main latch bolt 58 forwardly abutting the main latch bolt, with this latch bolt extension extending rearwardly from the main latch bolt and having the broadened, forked rearward end 68 for forward and rearward guided, slidable movement through the slot 44 of case rear wall 36, while still clearing the mounting screw openings 56 of case extension 40. Latch bolt extension 60 is also formed intermediate and adjacent the sides thereof with the spaced, upstanding, forwardly projecting retraction tabs 70 having the forwardly projecting and facing abutment surfaces 72 for co-action with the retractor slide 62 through the retractor lever 64, as will be hereinafter more fully explained.

Main latch bolt 58 is formed with the usual angled forward surface 74 for engagement with the usual door-frame strike plate (not shown) to slide the bolt rearwardly between extended position (FIG. 6) and retracted position (FIG. 9) and the flat latch surface 76 for transverse engagement with the doorframe strike plate when the bolt is in extended position. The bolt angled forward surface 74 terminates rearwardly in a forwardly facing positioning shoulder 78 and the bolt latch surface 76 terminates rearwardly in the spaced, forwardly facing positioning shoulders 80, all for rearward engagement with the front faceplate 28 around the main latch bolt opening 32 to establish the forwardly urged extended position of main latch bolt 58 projecting forwardly through the front faceplate. Between the positioning shoulders 80 and spaced slightly rearwardly thereof, the bolt latch surface 76 terminates in the rearwardly facing engagement shoulder 82 extending inwardly between this latch surface and the bolt clearance recess 66, and also, as best seen in hidden lines in FIG. 2, bolt 58 is formed with a slightly angled blocking shoulder 84 facing rearwardly and within the clearance recess 66, both for important purposes to be hereinafter discussed.

The main latch bolt 58 is also formed with a rearwardly opening spring recess 86 adjoining the clearance recess 66 and adjacent the latch bolt extension 60. When the

main latch bolt 58 and latch bolt extension 60 are received within the case 20, this bolt spring recess 86 aligns with the main bolt mounting prong 46 on the one sideplate 42 of case extension 40 and a coil compression spring 88 is positioned within spring recess 86 extending rearwardly over main bolt mounting prong 46 and engaging the spring seat 52 of this mounting prong, as shown in FIG. 6. Thus, spring 88 will normally resiliently urge main latch bolt 58 and latch bolt extension 60 longitudinally forwardly in case 20 into the extended position of the main latch bolt projecting forwardly through faceplate 28.

Retractor slide 62 is positioned between latch bolt extension 60 and main bolt mounting prong 46 extending rearwardly through slot 44 of case rear wall 36 between case extension sideplates 42. The restricted forward end 90 of retractor slide 62 is formed with the oppositely depending retractor tabs 92 which provide the spaced, rearwardly facing abutment surfaces 94 for co-action with the retractor lever 64, as will be hereinafter described. Retractor slide 62 is also formed with the elongated clearance opening 96 for clearing the mounting screw openings 56 of case extension sideplates 42 during forward and rearward longitudinal slidable movement of this retractor slide within case 20 and case extension 40 and, more important, with the rollback opening 98 having spaced, forwardly facing retraction shoulders 100 with inwardly forwardly sloping cam surfaces 101 for abutting engagement by a semicircular rollback 102, as shown in FIG. 1.

The retractor lever 64 is flat and generally U-shaped, having spaced legs 104 and a leg connecting portion 106. As best seen in FIGS. 6 and 10, the retractor lever legs 104 are formed with forwardly extending, arcuate bulges or projections 107 adjacent leg connecting portion 106 to form spaced, forwardly facing, arcuate abutment surfaces 108 and the upper ends of the legs form the spaced, rearwardly facing, flat abutment surfaces 110. Also, a partially circular side surface 112 is formed on retractor lever 64 at the outer sides of legs 104 and leg connecting portion 106, with this side surface substantially conforming to the cylindrical contour of the case 20.

In assembly, the longitudinally overlapping latch bolt extension 60 and retractor slide 62 are both received within retractor lever 64 between retractor lever legs 104, with retractor lever leg connecting portion 106 forward of case abutments 38 and with the broadened, rearwardly facing pivot surface on the retractor lever leg connecting portion abutting the broadened, forwardly facing pivot surfaces 116 on the case abutments, as shown in FIG. 6. Also as shown in FIG. 6, when the main latch bolt 58 is in extended position, retractor lever 64 is angled forwardly, with the forwardly facing abutment surfaces 108 on the projections 107 engaging the rearwardly facing abutment surfaces 94 on retractor slide tabs 92 and with rearwardly facing abutment surfaces 110 engaging the forwardly facing abutment surfaces 72 on latch bolt extension tabs 70. Thus, rearward longitudinal sliding of retractor slide 62 will cause rearward pivoting of retractor lever 64 about case abutments 38, such pivotal movement of the retractor lever being slidably guided by case 20 due to the conforming contours thereof, and this rearward pivoting of the retractor lever will force rearward sliding of main latch bolt 58 through latch bolt extension 60, moving the main latch bolt from extended toward retracted position.

It will be particularly noted that due to the particular positioning of latch bolt extension 60 and retractor slide 62 relative to retractor lever 64 and the particular method of pivoting of the retractor lever over case abutments 38, certain mechanical advantages are inherent in this retraction arrangement. First, in view of the fact that the engagement of retractor slide 62 with retractor lever 64 is at a lesser distance from retractor lever pivot surface 114 than is the engagement of latch bolt extension 60 with

this retractor lever, rearward movement of the retractor slide will necessarily impart greater rearward movement to the latch bolt extension and therefore main latch bolt 58. Secondly, and as best seen by comparing FIGS. 6 and 9, as retractor lever 64 pivots rearwardly during this retraction movement of retractor slide 62 and latch bolt extension 60, the transverse line of pivoting of retractor lever pivot surface 114 over case abutment pivot surfaces 116 moves progressively closer to the retractor slide and latch bolt extension, thereby again progressively increasing this mechanical advantage.

The dead latch bolt assembly includes the dead latch bolt 118, the dead latch dog 120 and the coil compression spring 122. Dead latch bolt 118 has the forwardly projecting, semicircular cross section bolt portion 124, the intermediate, transversely projecting engagement portion 126 forming the forward engagement shoulder 128 and transverse engagement flange 130, and the rearwardly projecting nearly cylindrical mounting portion 132 formed with the longitudinally extending mounting slot 134. The dead latch dog 120 is formed with the transverse notch 136 in the forward portion thereof providing the forward blocking projection 138 and the intermediate throwout abutment 140. The rearward end of the dog 120 is formed with the generally transversely extending and slotted, but slightly angled, mounting flange 142, this flange being clearly shown in FIGS. 2 and 6.

Dead latch bolt 118 is mounted adjacent the main latch bolt 58, with bolt portion 124 longitudinally slidable along main bolt latch surface 76, engagement shoulder 128 longitudinally aligned for forward engagement with main bolt engagement shoulder 82, and mounting portion 132 slidably receiving the forward end of dead bolt mounting prong 48 in the mounting slot 134 thereof, all as shown in FIGS. 2 and 6. Also as shown, dead latch dog 120 is positioned with mounting flange 142 thereof receiving the rearward end of dead bolt mounting prong 48, with the main part of this dog abutting latch bolt extension 60. Spring 122 is telescoped over dead bolt mounting prong 48, with the forward end thereof received over dead bolt mounting portion 132 and against dead bolt engagement portion 126, and the rearward end of this spring bears against mounting flange 142 of dead latch dog 120.

Thus, spring 122 normally urges dead latch bolt 118 to extended position, as shown in FIGS. 2 and 6, but permits rearward movement of this dead latch bolt to retracted position, either with and through main latch bolt 58, as shown in FIG. 9, or separate from the main latch bolt, as shown in FIGS. 7 and 8. Spring 122, due to the angling of the mounting flange 142 of dead latch dog 120, normally pivotally urges this dead latch dog from nonblocking position aligned for reception fully within main bolt clearance recess 66, as shown in FIG. 2, to blocking position transversely pivoted into longitudinal alignment with main bolt blocking shoulder 84, as shown in FIG. 7. It will be noted, however, that when dead latch bolt 118 is in extended position, engagement flange 130 on engagement portion 126 thereof is transversely aligned and abutting blocking projection 138 of dead latch dog 120 retaining this dog in nonblocking position, while rearward movement of dead latch bolt 118 permits the reception of engagement flange 130 within dead latch bolt notch 136 normally permitting spring 122 to pivot dead latch dog 120 toward blocking position. It should also be noted that when retractor lever 64 is in forward pivoted position, throwout abutment 140 of dead latch dog 120 is behind the one retractor lever leg 104, and when dead latch dog 120 is in blocking position, as shown in FIG. 7, this throwout abutment 140 is in longitudinal interference with retractor lever leg 104.

In operation of the embodiment of the latch bolt mechanism of the present invention, and with the mechanism mounted in a door (not shown) in the usual manner, closing movement of the door will cause the doorframe

strike plate (not shown) to engage main latch bolt 58 forcing this bolt through angled forward surface 74 to move from extended position, shown in FIGS. 2 and 6, to retracted position, shown in FIG. 9. This rearward movement of main latch bolt 58 will carry dead latch bolt 118 rearwardly from extended to retracted position and, at the same time, will slide latch bolt extension 60 rearwardly, pivot retractor level 64 rearwardly and slide retractor slide 62 rearwardly due to the abutting connection between latch bolt extension 60, retractor slide 62 and retractor lever 64. Dead latch dog 120 will remain in nonblocking position, even though dead bolt engagement flange 130 has moved rearwardly away from engagement with blocking projection 138 of dead latch dog 120, since retractor lever 64 in its rearward pivoting movement will have engaged throwout abutment 140 on dead latch dog 120, retaining this dog from pivoting toward blocking position until the main bolt blocking shoulder 84 has moved rearwardly of blocking projection 138 on dead latch dog 120.

After the door has completely closed, main latch bolt 58 will again move forwardly to extended position, but dead latch bolt 118 will remain in retracted position retained by the doorframe strike plate, so that the mechanism will be in the position shown in FIGS. 7 and 8. During this extended movement of main latch bolt 58 with dead latch bolt 118 retained in retracted position, retractor lever 64 will ultimately pivot forwardly past throwout abutment 140 of dead latch dog 120, permitting spring 122 to pivot dead latch dog 120 from nonblocking to blocking position so that blocking projection 138 of dead latch dog 120 is longitudinally rearwardly aligned with main bolt blocking shoulder 84, as shown in FIG. 7. Thus, any attempt to move main latch bolt 58 rearwardly by an outside force directly against this main latch bolt will only move the latch bolt rearwardly until blocking projection 138 of dead latch dog 120 engages main bolt blocking shoulder 84, at which point, no further rearward movement of main latch bolt 58 can take place.

When it is desired to again open the door by turning one of the doorknobs (not shown) so as to rotate rollback 102, such rotation of rollback 102 will engage one of the retraction shoulders 100 on retractor slide 62, forcing this retractor slide to slide rearwardly. Rearward movement of retractor slide 62 will pivot retractor lever 64 rearwardly to slide latch bolt extension 60 and main latch bolt 58 rearwardly, moving main latch bolt 58 from extended position, as shown in FIGS. 7 and 8, to retracted position, shown in FIG. 9. Furthermore, during the rearward pivoting of retractor lever 64, this retractor lever will again engage throwout abutment 140 on dead latch dog 120, pivoting this dead latch dog from the blocking position, as shown in FIG. 7, to nonblocking position and permitting the withdrawal of main latch bolt 58.

It will be noted, and as can be determined from a study of FIG. 1, as the rollback 102 is rotated to force the retractor slide 62 rearwardly for withdrawing the main latch bolt 58, the rollback will begin to move inwardly along the inwardly-forwardly sloping cam surfaces 101 on one of the retraction shoulders 100 of the retractor slide and the inward movement along the sloping cam surface will continue progressively as the rollback is rotated a greater and greater degree. Thus, there is never a stage during the rotation of the rollback 102 during which rearward movement of the retractor slide 62 and, therefore, the main latch bolt 58 is not imparted. The sloping cam surfaces 101 on the retraction shoulders 100 of the retractor slide 62 will thereby insure that the main latch bolt 58 will always be fully retracted and that there will be no wasted motion during such retraction of the rollback 102.

Where it is desired to provide a latch bolt mechanism without the dead latch bolt feature, it is merely neces-

sary to remove this portion of the mechanism, with the remaining parts and components being constructed exactly the same. Such a latch bolt mechanism is shown in FIG. 11 and the only alterations necessary from the mechanism just described, in addition to the elimination of dead latch bolt 118, dead latch dog 120 and spring 122, is the elimination of the dead latch bolt opening 34 in front faceplate 28 and elimination of dead bolt mounting prong 48. Otherwise, the mechanism remains the same and operates in the same manner without the dead latch bolt feature.

In the case where the latch bolt mechanism of the present invention is to be installed in a door wherein it is desired to provide the placement of the doorknobs and, therefore, the rollback 102 an increased distance from the edge of the door from which the main latch bolt 58 will project, it is merely necessary to increase the length of the case extension 40, that is, the lengths of the sideplates 42, as well as the length of the retractor slide 62, and provide special stiffening means for the case extension sideplates. Such a construction is illustrated in FIGS. 12 and 13 wherein the case extension 40 extending rearwardly from the case 20 is lengthened, as is the retractor slide 62, with the case extension sideplates 42 being formed with embossed, lengthwise extending reinforcing ribs 144. Further, the retractor slide 62 is formed with a lengthwise extending clearance slot 146, with sideplate spacing tab 148 being formed projecting laterally there-through from one of the sideplates 42 laterally through the slot and abutting the other of the sideplates so as to maintain proper spacing of the sideplates for the greater extension thereof.

Thus, according to the principles of the present invention, I have provided a latch bolt mechanism which is of maximum simplicity, yet positively operable, particularly by the provision of the separate retractor lever 64 providing the operable connection between main latch bolt 58 and retractor slide 62 which serves the dual purpose of controlling dead latch dog 120 to permit normal operation of the latch bolt mechanism. Also, no special guiding means is required for this unique retractor lever 64, but rather, the case 20 serves directly as surface guide means for the pivotal movement of retractor lever 64 due to the co-operating formations thereof.

Still further, efficiency of construction is provided by the particular formation of the case 20 and the case extension 40 having the laterally spaced sideplates 42. According to the present invention, the various described tabs and strengthening ribs may be provided on and between the sideplates 42, as well as between the case 20 and said sideplates in order to assure proper spacing of said sideplates for the proper forward and rearward movement of the retractor slide 62 therein. Also, the unique faceplate means on the case 20 permits limited shifting of said case relative to the faceplate means so that slight misalignments between said case and said faceplate means through mounting of the latch bolt mechanism will not destroy the various operable elements of said latch bolt mechanism.

I claim:

1. In a latch bolt mechanism, the combination of: a case, a latch bolt longitudinally movable in said case between forward extended and rearward retracted positions, said bolt having forwardly facing surfaces thereon; a retractor slide longitudinally movable in said case and extending rearwardly of said bolt, said retractor slide having rearwardly facing surfaces formed thereon; a separate, substantially flat retractor lever extending laterally across said case and positioned longitudinally flatwise pivotal in said case, said retractor lever having rearwardly facing surfaces engaged in abutment with said bolt forwardly facing surfaces and having forwardly projecting bulges engaged by abutment with said retractor slide rearwardly facing surfaces, said retractor lever being free of connection with said bolt and slide other than

through said abutments, said retractor lever surface and bulge abutment engagements between said bolt and slide combined with said lever pivotal movement translating forward and rearward movement of said slide into consequent forward and rearward movement of said bolt; and means for moving said retractor slide.

2. A latch bolt mechanism as defined in claim 1 in which said case includes a longitudinally rearwardly extending case extension having laterally spaced sideplates partially received longitudinally forwardly into said case; in which said retractor slide is longitudinally movable in said case extension laterally between said case extension sideplates; and in which there is tab means extending from said case and projecting into said sideplate lateral spacing between said case extension sideplates adjacent said retractor slide for maintaining said lateral spacing of said extension sideplates.

3. A latch bolt mechanism as defined in claim 1 in which said case includes a longitudinally rearwardly extending case extension having laterally spaced sideplates, said case extension sideplates having forward ends received longitudinally forwardly through slot means formed in a case rearward end, said sideplate forward ends having means thereon transversely engaged with said case maintaining said case extension and case assembled upon the maintainment of said sideplate lateral spacing; in which said retractor slide is longitudinally movable in said case extension laterally between said case extension sideplates; and in which there is tab means depending from said case and projecting into said sideplate lateral spacing between said case extension sideplates adjacent said retractor slide for maintaining said lateral spacing of said case extension sideplates.

4. A latch bolt mechanism as defined in claim 1 in which said means for moving said retractor slide includes a laterally extending rollback having means thereon for moving said slide upon limited rotation of said rollback; and in which said retractor slide includes a rollback opening formed laterally therethrough and receiving a part of said rollback, retraction shoulder means formed at said rollback opening for abutting pivotal engagement by said rollback means during said limited rotation of said rollback, generally laterally extending and longitudinally sloping cam surface means on said shoulder means engageable by said rollback means at least during a portion of said rollback limited rotation for maintaining movement through said cam surface means of said retractor slide throughout said rollback limited rotation.

5. A latch bolt mechanism as defined in claim 1 in which said case includes a case extension extending rearwardly thereof having laterally spaced sideplates partially received slidably forwardly into said case; in which said retractor slide is longitudinally movable in said case extension laterally between said extension sideplates; and in which said case extension sideplates include generally longitudinally extending reinforcing rib means formed thereon for longitudinally stiffening said sideplates preventing deformation destroying said sideplate lateral spacing.

6. A latch bolt mechanism as defined in claim 1 in which said case includes a case extension extending rearwardly thereof having laterally spaced sideplates; in which said retractor slide is longitudinally movable in said case extension laterally between said extension sideplates, said slide having a clearance opening formed laterally therethrough; and in which said case extension sideplates include spacing tab means extending laterally between said sideplates from one to and against of said sideplates for maintaining said sideplate lateral spacing, said spacing tab means extending laterally through said retractor slide clearance opening at all times free of said slide and permitting said slide longitudinal movement.

7. In a latch bolt mechanism, the combination of: a case; a longitudinally rearwardly extending case extension operably connected to said case and having laterally

spaced sideplates extending forwardly partially into said case; a latch bolt longitudinally movable in said case between forward extended and rearward retracted positions; a retractor slide longitudinally movable in said case extension laterally between said case extension sideplates; means operably connecting said latch bolt and retractor slide for translating forward and rearward movement of said slide into consequent forward and rearward movement of said bolt; means for moving said retractor slide; and tab means depending from certain of said case and case extension projecting into said sideplate lateral spacing between said case extension sideplates free of interference with said retractor slide forward and rearward movement for maintaining through lateral interference said lateral spacing of said case extension sideplates.

8. A latch bolt mechanism as defined in claim 7 in which said tab means includes tabs extending from said case and projecting into said sideplate lateral spacing between said case extension sideplates adjacent and free of said retractor slide.

9. A latch bolt mechanism as defined in claim 7 in which said retractor slide includes a clearance opening formed laterally therethrough; and in which said tab means includes a spacing tab secured laterally between said case extension side plates from one to and against the other of said sideplates, said spacing tab extending laterally through said retractor slide clearance opening at all times free of said slide and permitting said slide longitudinal movement.

10. A latch bolt mechanism as defined in claim 7 in which said retractor slide includes a clearance opening formed laterally therethrough; in which said case extension sideplates include reinforcing rib means formed thereon for longitudinally stiffening said sideplates preventing deformation destroying said sideplates lateral spacing; and in which said tab means includes spaced tabs extending from said case and projecting into said sideplate lateral spacing between said case extension sideplates adjacent and free of said retractor slide, a spacing tab secured laterally between said sideplates from one to and against the other of said sideplates, said spacing tab extending laterally through said retractor slide clearance opening at all times free of said slide permitting said slide longitudinal movement.

11. A latch bolt mechanism as defined in claim 7 in which said means for moving said retractor slide includes a laterally extending rollback having means thereon for moving said slide upon limited rotation of said rollback; and in which said retractor slide includes a rollback opening formed laterally therethrough and receiving a part of said rollback, retraction shoulder means formed at said rollback opening for abutting pivotal engagement by said rollback means during said limited rotation of said rollback, generally laterally extending and longitudinally sloping cam surface means on said shoulder means engageable by said rollback means at least during a portion of said rollback limited rotation for maintaining movement through said cam surface means of said retractor slide throughout said rollback limited rotation.

12. In a latch bolt mechanism, the combination of: a case; a latch bolt longitudinally movable in said case between forward extended and rearward retracted positions, said bolt having forwardly facing surfaces thereon; a retractor slide longitudinally movable in said case and extending rearwardly of said bolt, said retractor slide having rearwardly facing surfaces formed thereon; a separate, substantially flat retractor lever longitudinally pivotal in said case, said retractor lever being generally U-shaped in lateral cross-section forming laterally spaced leg portions, said retractor lever having rearwardly facing surfaces engaged with said bolt forwardly facing surfaces and having forwardly projecting bulges formed on said lever leg portions engaged with said retractor slide rearwardly facing surfaces, the remainder of said lever other than said

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forwardly projecting bulges being substantially flat, said retractor lever surface and bulge engagement between said bolt and slide combined with said lever pivotal movement translating forward and rearward movement of said slide into consequent forward and rearward movement of said bolt; and means for moving said retractor slide.

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