

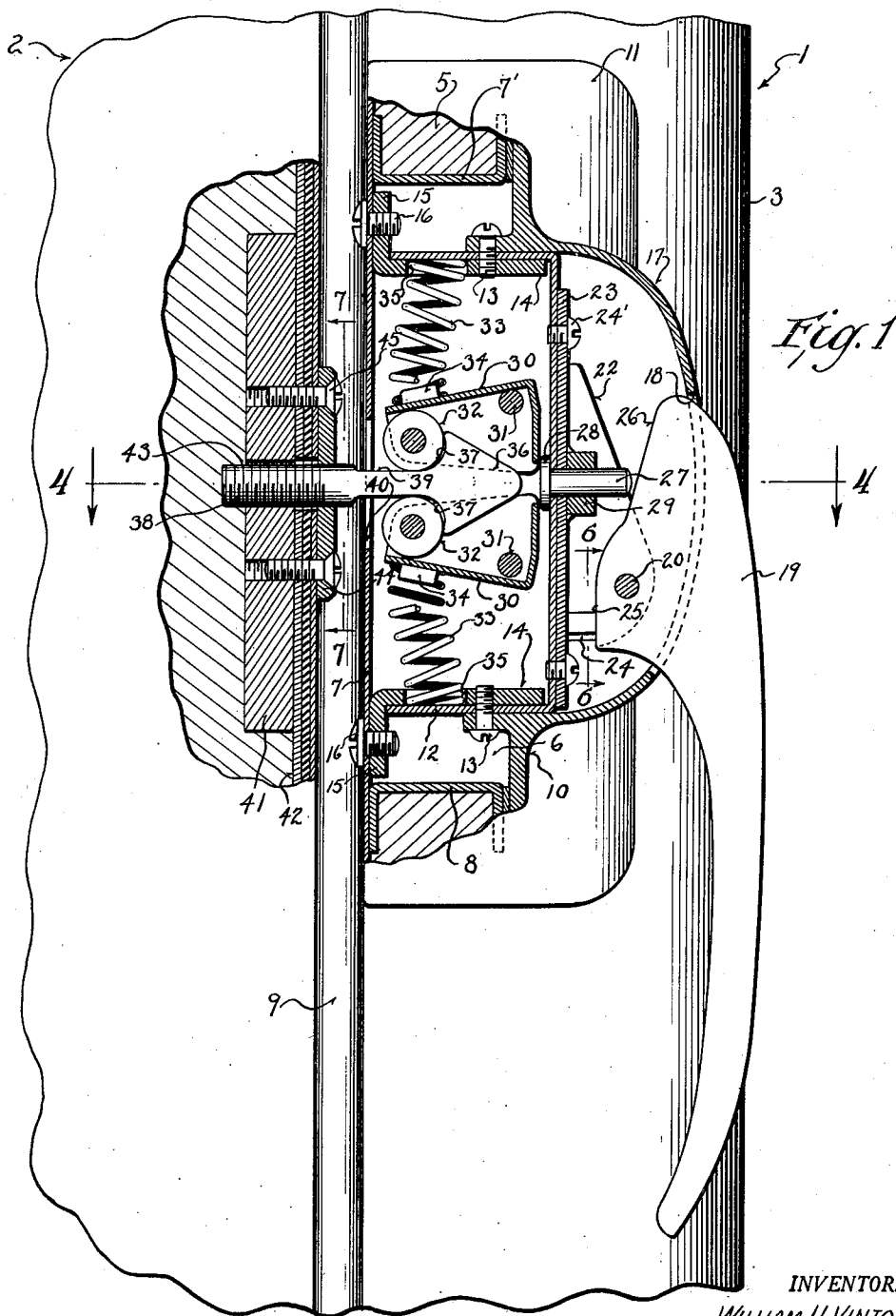
April 4, 1950

W. U. VINTON
LATCH

2,502,607

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3 Sheets-Sheet 1



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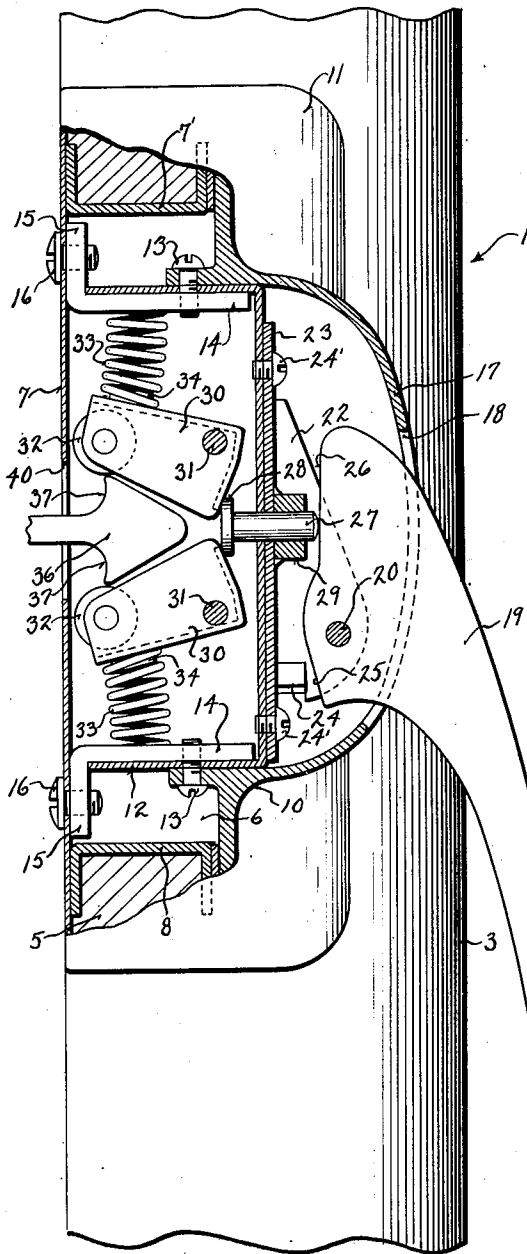


Fig. 2

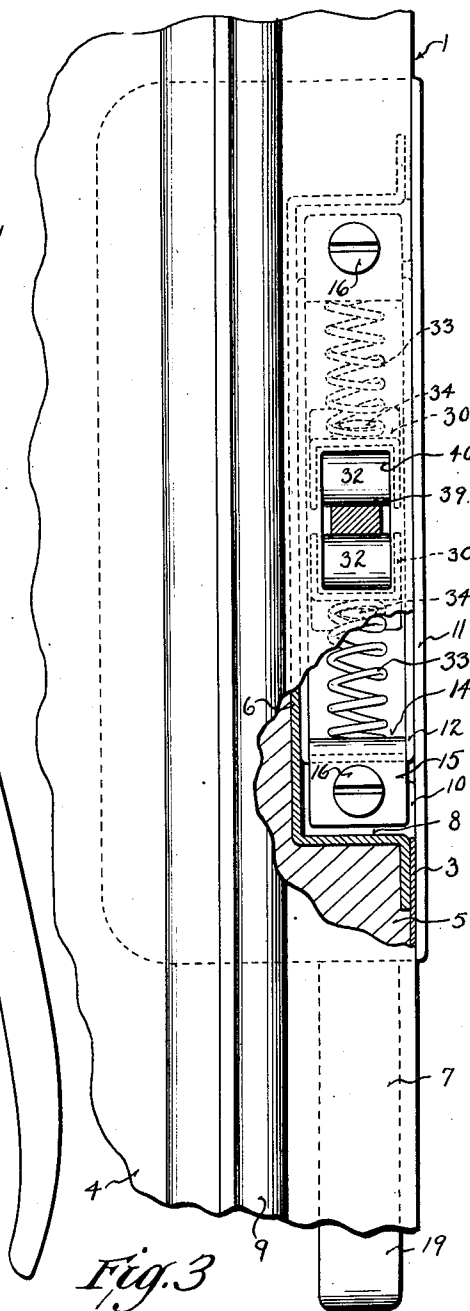


Fig. 3

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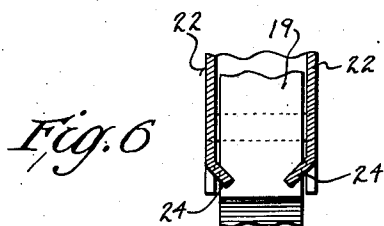
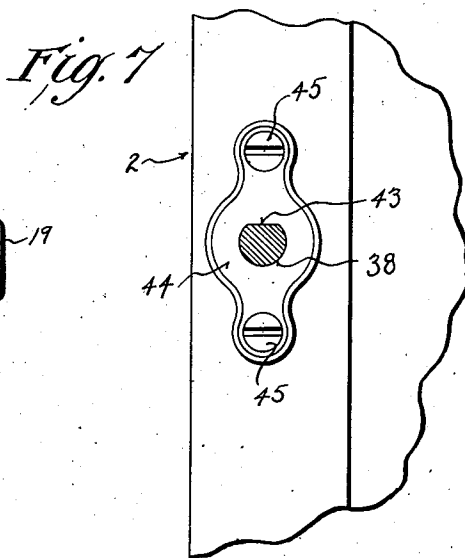
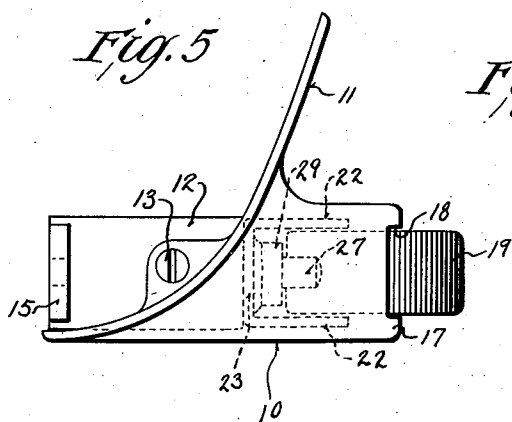
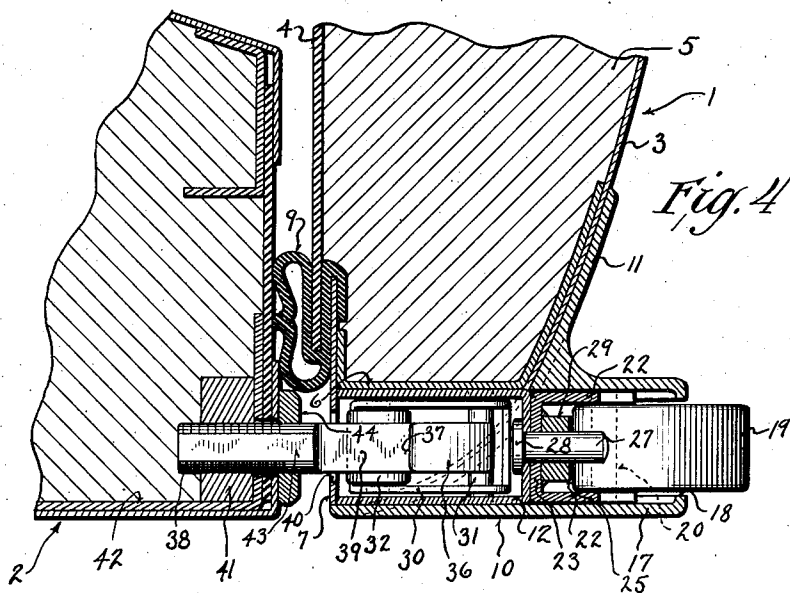
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LATCH

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1 Claim. (Cl. 292—23)

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This invention relates to latches for cabinets and is particularly directed to a latch for a low temperature cabinet.

In latches for cabinets as heretofore constructed, it has frequently happened that that latch is so constructed that there is an unbalanced force which is transmitted to the door and tends to either shift or distort the door. Also in certain types of latches there is a considerable amount of unnecessary friction which materially hampers the free operation of the latch. In addition to this, usually the latches are so constructed that they do not draw the door inwardly to any appreciable extent but merely latch the door after the door has been forced to the innermost position that it is to occupy. When it is considered that these doors are so arranged that they compress yielding gaskets or seals around the margins of the doors, it is apparent that it is highly desirable to insure adequate compression of the gaskets so as to prevent entrance of air around the margins of the door.

This invention is designed to overcome the above noted defects and objects of this invention are to provide a novel form of latch which is particularly suitable for low temperature cabinets where the door compresses a yielding gasket and thus provides a complete sealing effect all the way around the door and which is arranged to provide a balanced thrust or force from opposite directions so that there is no resultant force transmitted to the door which might tend to distort or cause shifting of the door.

Further objects are to provide a latch construction for a low temperature cabinet having a yielding gasket, which latch construction is so made that it has a very powerful inward pull to thus insure adequate compression of the sealing gasket and which is so made that it may be operated with a minimum of effort, the effective operating parts of the latch being arranged symmetrically about the catch so that they press in diametrically opposite directions and thus produce a balancing of the forces as heretofore mentioned.

Further objects are to provide a latch construction in which a large number of the parts are formed from simple stampings, which is so made that it may be very readily assembled and may be easily applied to the door, and which requires only a very small opening in the rear part of the door, and which is arranged to coact with the door and with the adjacent portions of the cabinet to prevent entrance of air through any portion of the latch.

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An embodiment of the invention is shown in the accompanying drawings, in which:

Figure 1 is a fragmentary view with parts broken away and in section showing the latch in its locked or latched position.

Figure 2 is a view corresponding approximately to Figure 1 and showing the latch in released position.

Figure 3 is a view looking at the edge of the door with parts broken away and in section.

Figure 4 is a sectional view on the line 4—4 of Figure 1.

Figure 5 is a top view of the latch detached from the door.

Figure 6 is a sectional view on the line 6—6 of Figure 1.

Figure 7 is a sectional view on the line 7—7 of Figure 1.

Referring to the drawings, it will be seen that a low temperature cabinet door has been indicated by the reference character 1 and that the body portion of the low temperature cabinet has been indicated by the reference character 2. The door indicated generally by the reference character 1 has an outer wall 3 and an inner wall 4 and has the space therebetween filled with an insulating material 5. At the point where the latch is positioned on the door a notch or rectangular opening is formed and is provided with an inner wall 6, see Figure 4, and upper and lower walls 7' and 8, see Figure 1. The rear wall 4 of the door extends to approximately the marginal edge of the door but is separated therefrom by means of a narrow marginal strip 7 which forms a part of the rear wall of the door. A yielding gasket indicated generally at 9 is carried either by the door or by the body of the cabinet. As shown in Figure 4, this sealing gasket is carried by the door.

Any suitable type of sealing gasket could be employed with the form of latch disclosed by this invention provided there is a certain degree of yield or compressibility of the gasket as will appear hereinafter.

The latch comprises an outer casting or member 10. The casting 10 is provided with a flanged portion 11 which is curved and which fits against the curved front wall 3 of the door, see Figures 1, 2, and 4. It is detachably secured to a metal box-like member or housing 12 by means of upper and lower screws 13. These screws pass through the upper and lower walls of the box-like member 12 and into upper and lower angle irons or fastening clips 14 which latter are of relatively heavy stock. These clips have angularly turned ends 15 which

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are positioned against the rear marginal portion 7 of the rear wall and are detachably secured thereto by means of upper and lower screws 16. The casting 10 is provided with an outwardly projecting portion 17 which is rectangular in horizontal cross-section and curved or arched in vertical cross-section as may be seen by a comparison of Figures 4 and 2. The portion 17 is provided with a slot 18 through which a handle 19 projects. The handle 19 is pivoted on a pin 20 carried by outwardly turned ears 22 formed integral with a plate 23, the plate being detachably secured to the outer wall of the housing or box-like member 12 by means of screws 24'. The ears 22 are provided with inwardly turned lips 24, see Figures 1, 2, and 6, which act as stops for the lower face 25 of the body portion of the handle 19. The upper face of the body portion of the handle is indicated by the reference character 26 and is adapted to coact with the rounded end of a plunger 27 to press the plunger inwardly when the handle is rocked in a counter-clockwise direction as viewed in Figure 2. The plunger 27 is provided with an inner head 28 and is prevented from tilting by the relatively thick apertured member 29 which is welded to the plate 23 and which provides an extended sliding bearing surface for slidably receiving the plunger 27.

A pair of arms or small levers 30 are formed of identical stampings and may be channel-shaped as indicated. The arms are pivoted on pins 31 carried by the box-like housing 12 and are provided with rollers 32 at their free or outer ends, the rollers being positioned within the channels of the arms 30, as shown clearly in Figures 1, 2, and 4. The levers 30 and consequently the rollers 32 are urged inwardly by means of relatively heavy compression springs 33 which are seated at one end around lugs 34 formed rigidly with the levers 30 and at their other ends in apertures 35 formed in the brackets 14. The inward motion of the rollers 32 and of the levers 30 is limited by the engagement with the flange or head 28 of the plunger 27 when such head bears against the rear wall of the housing or box-like member 12 as shown in Figure 1.

From an examination of Figures 1 and 2, it will be seen that the levers 30 constitute bell crank levers. Their long arms carry the rollers 32 and their short arms bear against the head 28 of the plunger 27. Consequently, it is clear that the springs 33 tend to rock the levers about their pivots 31 and to force the plunger 27 to the right, as viewed in Figures 1 and 2, and consequently tend to rock the handle down into its normal position shown in Figure 1. However, when the handle is pulled outwardly so that it rocks in a counter-clockwise direction from the position shown in Figure 1 to that shown in Figure 2, it will be seen that the plunger 27 is moved inwardly to the left. This causes outward rocking motion of the levers 30 against the action of the springs 33 and detaches the rollers 32 from the catch 36 hereinafter described.

The catch 36 is made with an arrow head at its end as shown very clearly in Figures 1 and 2. If desired, the inner surface of the rear portion of the arrow head may be rounded as indicated by the reference character 37 so as to conform approximately to the contour of the rollers. The arrow head is connected with a threaded stem portion 38 of the catch by means of a narrow flattened neck 39. It is to be noted from reference to Figure 2 that the rear wall, namely the portion 7 of the door, is provided with an aper-

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ture 40 slightly bigger than the arrow head 36 of the catch so as to allow the catch to enter the corresponding part of the door when the door is closed.

The catch is made adjustable by providing the threaded stem 38, hereinbefore described. This stem is screwed into a reinforcing or nut-like member 41 located inwardly of a reinforcing bracket 42 and the bracket and nut-like portion are secured within the body portion 2 of the cabinet. The threaded stem 38 of the catch is provided with a flattened portion or cut-away portion 43. A locking plate or fitting 44, see Figure 7, is passed over the stem 38 and is contoured to fit the stem with its flattened portion 43 and to prevent rotation of the stem under normal conditions. This fitting 44 is detachably secured to the body portion 2 of the cabinet by means of screws 45. This construction, therefore, allows adjustment of the latch inwardly or outwardly to compensate for wear on the gasket 9 due to extended use of the low temperature cabinet. For instance, the screws 45 may be removed and the latch given a half turn, this adjustment of the catch being made while the door is in open position. Thereafter the screws 45 are replaced and the catch is prevented from further rotation. The catch may thus be screwed in or out to provide the exact adjustment desired to secure adequate and accurately adjusted compression of the sealing gasket 9, see Figure 4.

The door, in locked position, is shown in Figure 1. When the handle 19 is rotated in a counter-clockwise direction the rollers 32 are moved outwardly to the position shown in Figure 2, out of locking engagement behind the arrow head 36 of the catch and consequently the door may be pulled open by continued pulling of the handle. When the door is closed, the arrow head 36 of the catch passes between the rollers 32 and forces the rollers apart as the tapered arrow head passes therebetween. This compresses the springs 33. However, as soon as the center of rotation of the rollers 32 passes behind the ears of the arrow head 36, the rollers are forced inwardly with a heavy pressure by means of the springs 33 towards the position shown in Figure 1 and thus an extremely heavy inward thrust is imparted to the door. This draws the door tightly closed and compresses the gasket 9. The position shown in Figure 2 is that where the center of rotation of the rollers is just passing the extreme ends of the rear portions of the arrow head 36 of the catch. From this position to that shown in Figure 1, it will be seen that the door has been moved inwardly a material distance, thus adequately and powerfully compressing the gasket 9 and securing a perfect seal without any effort on the part of the operator.

It is apparent that a very small opening is required in the rear fall of the door for the passage therethrough of the catch portion of the latch. The curved portion 11 of the main casting 10 of the latch constitutes, in effect, an escutcheon and provides a finish for the door. In addition to this, it covers the front opening or rectangular notch formed in the door.

It is to be noted particularly that the latch is formed of very simple parts and is so arranged that the springs 33 produce a balanced thrust from opposite directions and consequently no resultant force tending to distort or shift the door is imparted to the door. There is thus no tendency due to the latch towards causing the door to sag or become shifted or distorted. In

addition to this, actual tests have shown that a latch constructed in accordance with the disclosure of this invention is easily capable of producing as much as a 150-pound inward pull on the door though this figure is not to be taken as a limiting value but merely as an illustration of the result of one design of the latch. Obviously the latch could be designed to provide any desired thrust tending to close the door. Also it is to be noted that the latch actually pulls the door inwardly during the automatic final closing motion or latching motion of the latch and, therefore, all the operator is required to do is to move the axis or center point of rotation of the rollers just inwardly past the inner corners of the arrow head shaped end of the catch, the latch thereafter acting automatically to complete the inward closing motion of the door and to produce a heavy compression of the gasket 9, see Figures 1 and 4.

It is to be noted that many of the parts of the latch are duplicates and are of very simple construction and may be formed of stampings. The levers 30 are duplicates and are easily formed from stampings. The rollers 32 as well as the springs 33 and the clips 14 are also duplicates.

A further feature of material importance is the ease with which the latch may be applied to the door or removed therefrom for inspection or repair. Only two screws 16, see Figure 2, need be removed and thereafter the latch may be lifted directly outwardly from the door. The other parts of the latch may be readily disassembled and reassembled as required.

It will be seen, therefore, that a novel form of latch has been provided which is particularly suitable for a low temperature cabinet and which exerts an inward powerful closing force on the door and is easy to operate and is of a simple and readily made construction.

Although this invention has been described in considerable detail, it is to be understood that such description is intended as illustrative rather than limiting, as the invention may be variously embodied and is to be interpreted as claimed.

I claim:

A latch construction for a cabinet having a body portion and a door, said latch construction comprising a catch carried by said body portion and projecting outwardly therefrom and terminating in an arrow head shaped end, and a latch construction comprising a housing, a pair of pivoted levers mounted within said housing and provided with rollers at their free ends adapted to engage inwardly of the arrow head end of said catch, the axes of said rollers being parallel to the axes about which said levers pivot, spring means urging said rollers towards each other, said rollers coacting with the arrow head shaped end of said catch to draw said door inwardly, a plunger adapted to rock said levers and move said rollers apart to disengage said rollers from said catch, said plunger being guided and passing through said housing, and a handle pivotally supported from said housing and having a portion arranged to bear against and project said plunger inwardly when said handle is rocked.

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