Aug. 15, 1944. T. L. ROBERTS 2,355,895

AUTOMATIC RELEASABLE LOCK

Filed April 20, 1942

FIG. 1.

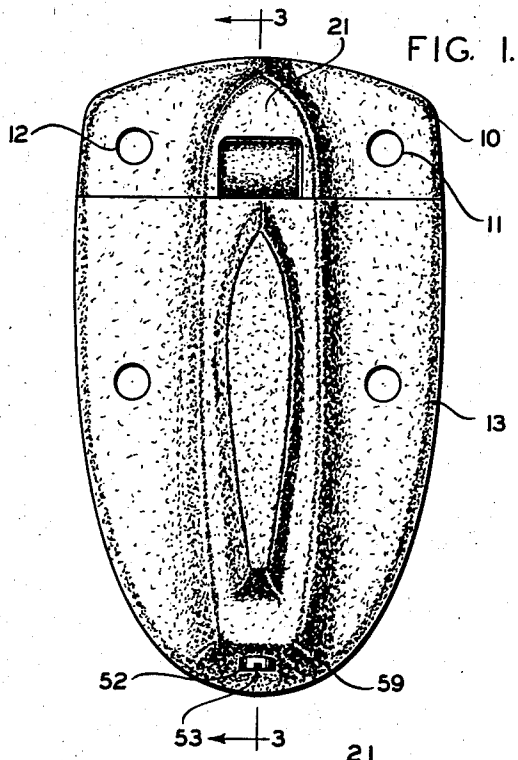
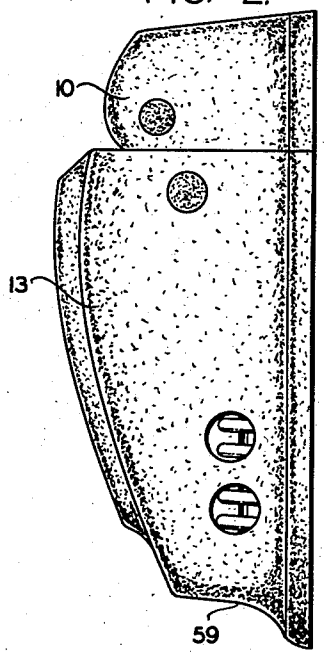


FIG. 2.



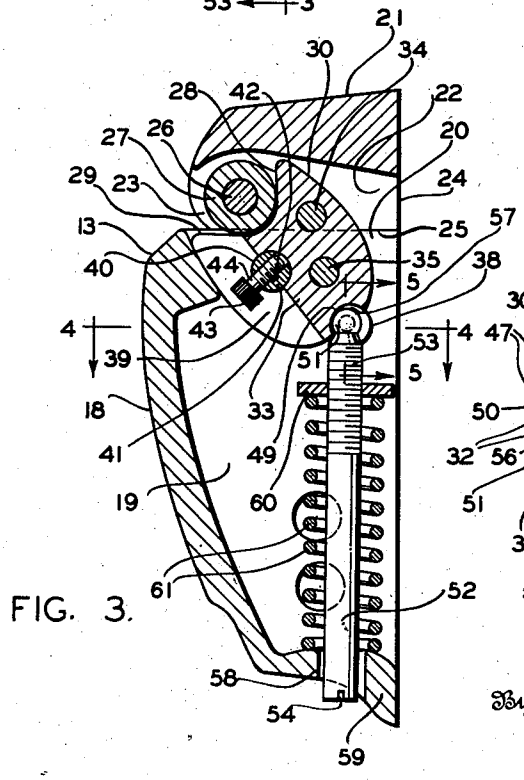


FIG. 3.

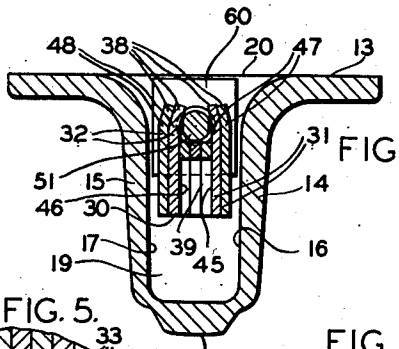


FIG. 4.

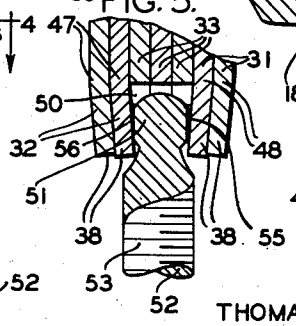


FIG. 5.

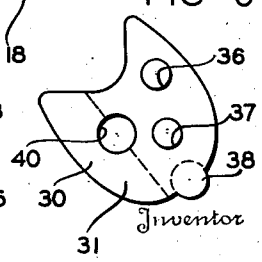


FIG 6

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AUTOMATIC RELEASABLE LOCK

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Application April 20, 1942, Serial No. 439,781

5 Claims. (Cl. 292—78)

My invention relates to automatic releasable locks and has for its object to provide a locking device adapted to be used in connection with heated ovens of any type but particularly ovens used in industry wherein there may occasionally happen some kind of an explosion.

Certain types of industrial ovens are used for heat treatment in various ways of articles put within the ovens. Such articles sometimes during the heat treatment give off fumes which when mixed with air within the oven may ignite and explode. In such ovens it is essential that the oven door, ordinarily large in extent, be firmly held in position. Yet, if this holding does not readily yield under impact of an explosion within the oven there may be serious wrecking of and injury to the oven itself and even the building and other devices surrounding it.

It is a principal object of my invention therefore, to provide an automatic locking device, which, while it will hold the oven door tight and very secure under normal conditions, yet can yield to permit swinging open of the door when excessive pressure develops from within from any cause, such, for example, as an explosion within the oven.

A further object of my invention is the provision of a lock member mounted to swing on a pivot and having angularly disposed contact surfaces such that when the door is swung to closing position one of these surfaces will be engaged by a fixedly positioned catch member in such manner that such engaged surfaces will be moved out of its line of movement during closing and the other surfaces will be moved behind the catch member to engage it and hold it in locking position, together with means for exerting spring pressure on the lock member to hold it in either of its adjusted positions.

It is a further object of my invention to form a lock member of a multiplicity of plates rigidly united together and to have some of these plates extend rearwardly to form spaced members which may be bent toward each other to form a rough socket and provide a member having a part adapted to enter said socket which may be turned and at the same time has means for holding it in one fixed position.

It is a further object of my invention to provide in connection with the aforesaid turnable member a strong spring surrounding it and a follower threaded upon said member so as to engage said spring, said follower being mounted in a channel with straight edged walls, the follower having corresponding walls adapted to engage the channel walls and prevent it from turning.

The full objects and advantages of my invention will appear in connection with the detailed description now given in the appended specification, and the novel features by which the aforesaid advantageous results are obtained are particularly pointed out in the claims.

In the drawing illustrating an application of my invention in one form—

Fig. 1 is a plan view of the lock casing in which my invention may be housed.

Fig. 2 is a side elevation of the same.

Fig. 3 is a sectional elevation view taken on line 3—3 of Fig. 1.

Fig. 4 is a transverse sectional plan view taken on line 4—4 of Fig. 3.

Fig. 5 is an enlarged sectional fragmentary view taken on line 5—5 of Fig. 3.

Fig. 6 is a full face plan view of the lock member dissociated from the other elements of the invention.

As illustrated, a member 10 is adapted to be bolted to a fixed oven wall by suitable bolt members passing through bolt holes 11 and 12. A second member 13 embodies side walls 14 and 15, Fig. 4, spaced apart and having inner plane walls 16 and 17, which inner walls may be parallel as shown in Fig. 4. The member 13 also has a thickened top wall 18. Between the side walls 14 and 15 and enclosed by the top wall 18 is a lock chamber 19 which is open at its face 20 as indicated in Figs. 4 and 5.

The member 10 fast on the oven wall is provided with a thick wall projecting portion 21, Figs. 1 and 3, having therein a transverse cavity 22, Fig. 3, which is open at its ends as indicated at 23 and 24, and which also is open along its extent fronting member 13 as indicated at 25, Fig. 3. When the parts are attached to a fixed furnace wall and a wall of the oven door is in closed locking position, as in Fig. 3, the open end 20 of chamber 19 and the open end 25 of chamber 22 will be in juxtaposed position so as to form one continuous substantially enclosed chamber.

Extending between the sides of the wall 21 is a strong shaft or pin 26 upon which is mounted a roller 27. This roller is adapted to be engaged by one or the other of a pair of faces 28 and 29 on a lock member 30. This lock member is formed of a multiplicity of sheet metal plates 31, 32 and 33, as clearly shown in Figs. 4 and 5. These metal plates are securely held together by suitable means, preferably by strong rivets 34 and 35, Fig. 3, extending through openings 36 and 37, Fig. 6. Any number of such plates may

be used, but in practice I have found it advantageous to use two of plates 31 and two of plates 32 on the outside of the lock member and three of plates 33 on the inside of the lock member. The plates, 31 and 32 are formed with semi-circular lip extensions 38, Figs. 4, 5 and 6, and the plates 33 are cut away as indicated at 39, in Fig. 3. A circular opening 40 extends fully through plates 31 and 32 and for a semi-circle through plates 33, and receives a shaft member 41, Fig. 3. Extending into a threaded opening 42 across shaft 41 is a set screw 44 which has its head 43 of such diameter as just to fit between the walls 45 and 46 of the cut-out space 39. By means of this set screw the rocking lock member 30 is held in a fixed position both axially and longitudinally on the shaft 41.

The plates 31 and 32 are turned toward each other as indicated at 47 and 48 of Figs. 4 and 5, and the plates 33 are semi-circularly cut out, as indicated at 49 of Fig. 3. This cut-out portion taken in conjunction with the turned-in portions 38 of plates 31 and 32 produces a flat-sided socket 50, Fig. 5. In this socket 50 is a head 51 fast on a bolt member 52 threaded at 53 adjacent the head 51, and formed with a screw driver slot 54 on its outer end, Fig. 3. The head 51 is spherical except, as best shown in Fig. 5, where it is provided with oppositely-disposed flat faces 55 and 56. The rounded end of head 51 thrusts against the curved bottom of cavity 50, as shown at 57 in Fig. 4, and the outer end of bolt member 52 protrudes through an opening 58 in the rear end wall 59 enclosing chamber 19 of lock member 13.

On the threaded portion 53 of bolt member 52 is threaded a follower nut 60, the walls of which are in close proximity with walls 16 and 17 of the chamber 19 in main lock casing 13. The head 51 in the cavity 50 is restrained from pulling out by reason of the fact the opposite faces of bent-in portions 38 of plates 31 and 32 forming the side walls of socket 50 prevent it. It follows that when the bolt 52 is turned in either direction the follower nut 60 will be caused to travel along the bolt either to put more or less compression on a heavy spring 61 surrounding bolt 52 and extending between the inner wall of end 59 and follower 60, as shown in Fig. 3.

Although the bolt 52 is thus permitted to turn for adjusting the compression of spring 61, which is absolutely essential for the purpose of my invention, the bolt must not be free to turn excepting when it is intended to be turned—that is, the closing and opening of the door and the consequent swinging of lock member 30 upon its supporting bolt 40 must not automatically turn or permit the turning of the bolt 52, which, because the spring 61 constantly urges the follower 60 toward the head 51, would normally tend to move the follower toward the head to loosen the hold of the lock nut. This might continue to a point where the door would not remain closed against normal internal pressure in the oven.

The arrangement above described of the flattened head 51 in the socket 50 enables the bolt 52 to be turned to any desired degree, and when the turning is finished the faces 55 and 56 of the head 51 will snap against the faces of the turned-in portions 38 of plates 31 and 32 and hold the bolt against turning.

The fact that the plates 31 and 32 and the bent extensions 38 thereof are of sheet steel with a normal ability to swing or yield is one of the things which makes the above operation possible.

I claim:

1. A releasable lock comprising a swinging lock-member formed of a series of sheet metal plates shaped and secured together to form a socket having a plane face, a spring-pressed member having a head in said socket engaged by said face with a yielding pressure, means for forcibly rotating said member against said pressure, and means on the head engageable with said face in one position of rotation of the head to hold the spring-pressed member against turning in the normal operation of the lock.

2. A releasable lock comprising a swinging lock member formed of a series of sheet metal plates shaped and secured together to form a socket having a pair of plane faces, a rotatable spring-pressed member having a head in said socket, and means on the head for engaging the walls of the socket normally to hold the member against turning.

3. A releasable lock comprising a swinging lock member formed of a series of sheet metal plates shaped and secured together to form a socket having a pair of oppositely disposed plane faces, a spring-pressed member having a head in said socket located between and engaged by said faces with a yielding pressure, means for forcibly rotating said member against said pressure, and means on the head engageable with said faces in one position of rotation of the head to hold the spring-pressed member against turning in the normal operation of the lock.

4. A releasable lock comprising a swinging lock member formed of a series of sheet metal plates shaped and secured together to form a socket having a pair of oppositely disposed plane faces, a spring-pressed member having a head in said socket located between and engaged by said faces with a yielding pressure, means for forcibly rotating said member against said pressure, and a pair of flat faces on opposite sides of the head, each engageable with one of said faces in one position of rotation of the head to hold the spring-pressed member against turning in the normal operation of the lock.

5. A releasable lock comprising a lock casing having a parallel-walled chamber, a lock member having two contact faces, means mounting said lock member to swing between the walls of said chamber, a socket on said lock member having parallel faces, a threaded member having a head formed with faces engageable with the faces of said socket to hold the threaded member from rotation during normal operation of the lock but otherwise rotatable by force within said socket, a follower on said threaded member engageable with the walls of the chamber and adapted to swing with the lock member past dead center of the point of pivot of the lock member to hold the same in fixed position on either side of said pivot, a spring engaging said follower to cause the same through the threaded bolt in the socket to exert force upon the follower, said follower and the faces on said head permitting said swinging motion within the parallel-walled chamber.

THOMAS L. ROBERTS.