Nov. 4, 1941. G. FEDELE 2,261,353

DOOR LOCK

Filed March 31, 1939

Fig. 1

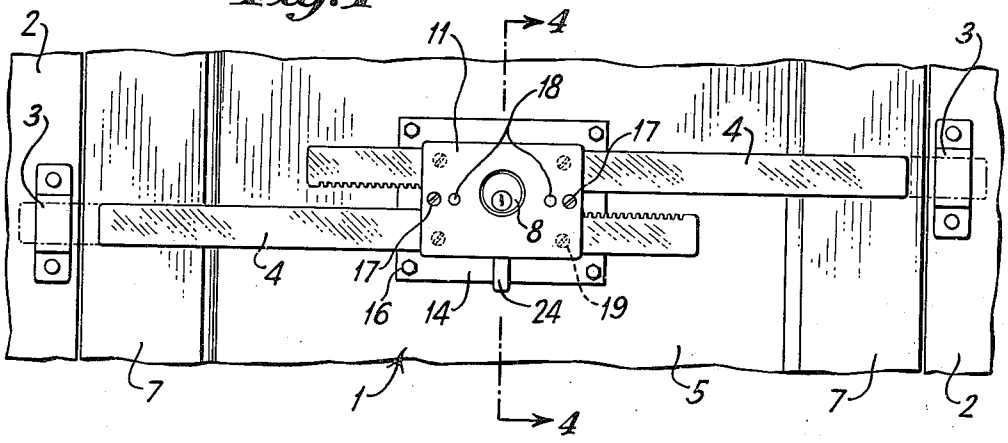


Fig. 2

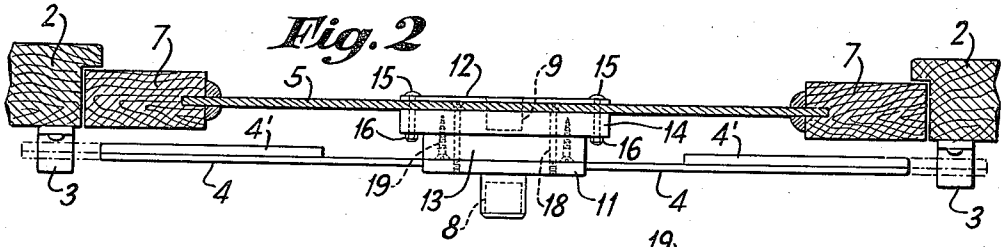


Fig. 4

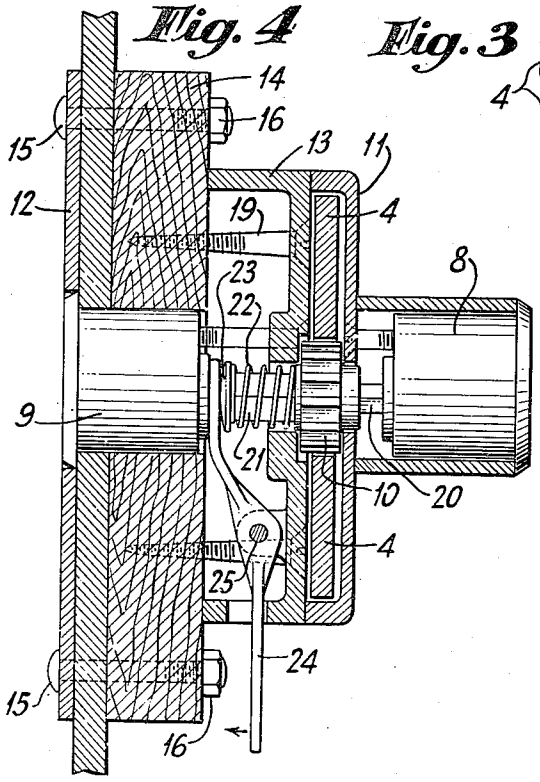


Fig. 3

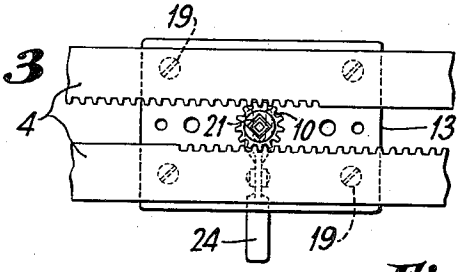
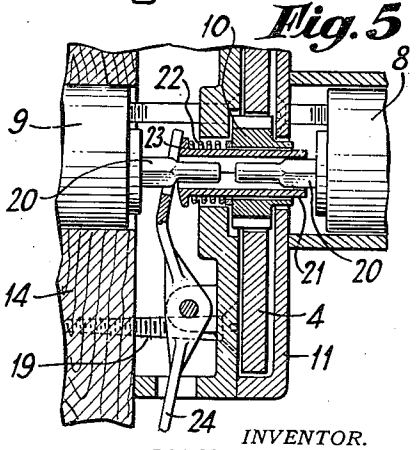


Fig. 5



INVENTOR.
GAETANO FEDELE

BY Charles H. Brown

ATTORNEY.

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2,261,353

DOOR LOCK

Gaetano Fedele, West New York, N. J.

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9 Claims. (Cl. 70—120)

This invention relates to locks, and more particularly to door locks. The lock of the present invention finds particular application in factories and lofts where it is desired to use a pair of key actuated locking bars or bolts which cooperate with keepers on opposite sides of the door frame.

One of the objects of the present invention is to provide a double cylinder door lock employing tumbler pins in both cylinders which can be operated from either inside or outside the door, only by means of keys.

Another object of the present invention is to provide a tamper proof, double cylinder door lock which will prevent a person on the inside of the door from obtaining access to the interior of the lock, and which lock can be opened from the inside of the door only by means of a key fitting the inner cylinder.

A further object is to provide a double cylinder door lock having a pair of oppositely disposed key actuated locking bars or bolts, wherein means are provided on one side of the lock for operatively associating said bars with that cylinder of the lock which is located on the same side as said means and for disassociating said bars from the cylinder on the other side of the lock.

A feature of the double cylinder door lock of the invention lies in the use of the lever and cooperating hollow tubing with the spring mechanism for switching the control of the locking bars or bolts from one cylinder to the other.

A more detailed description of the invention follows in conjunction with a drawing, wherein like parts are represented by like reference characters.

In the drawing:

Fig. 1 is an elevation view of the door lock of the invention, showing it in position in a door, as viewed from the inside of the door;

Fig. 2 is a plan view of the lock and door of Fig. 1;

Fig. 3 is a front elevation view of the lock of Fig. 1, with the face plate and inner cylinder removed, thus showing the interior of the lock;

Fig. 4 is a vertical cross-section of the lock taken on line 4—4 of Fig. 1. This view shows the locking bars or bolts operatively associated with the outer cylinder; and

Fig. 5 is a fragmentary cross-section of the lock of Fig. 1, taken along line 4—4, and shows the locking bars operatively associated with the inner cylinder.

Referring to the drawing in more detail, and particularly to Figs. 1 and 2, the door lock of the invention is shown mounted on a door 1 positioned between oppositely located uprights of a door frame 2. These uprights are provided with keepers 3 for accommodating the locking bars 4, 4 which extend through openings in opposite ends of the lock. The particular door shown in the drawing consists of a steel metal sheet 5 supported between two wooden supports 7, 7 forming part of the frame for the metallic sheet. It will be understood, of course, that any type of door can be used, and that this particular type is shown only because it is typical of factory and loft doors to which the lock of the invention finds particular application.

The lock includes two key actuated ordinary pin tumbler cylinders 8 and 9, both of which are adapted to control the movement of the locking bars 4, 4, though not simultaneously. These bars have adjacent rack ends which extend into the lock, as shown, and which in turn are driven by a circular gear or bolt operating member 10 (note Fig. 3). It is preferred that the bars 4, 4 be of massive construction and reinforced the ends, which protrude into the keepers 3, 3, by means of hard steel strips 4', 4' welded to the bars. In the particular construction shown in the drawing, it is assumed that cylinder 8 is on the inside of the door 1 and that cylinder 9 is on the outside of the door.

The housing or casing of the lock comprises an inner metallic face plate 11 constituting one side, an outer metallic face plate 12 constituting the other side, and an intermediate metallic casing 13. The inner face plate has grooves or openings in its side walls to enable movement of the locking bars 4, 4. For mounting the lock on the door, there is provided a thick wooden spacer block 14 of substantially the same width and length as the face plate 12, to which block this plate is fastened by four rivet head screws 15 and bolts 16. The face plate 11 is fastened to the metallic casing by two metal screws 17, and to the door and the wooden spacer block 14 by means of two long metal screws 18 whose heads are countersunk into the metal door sheet 5 under the plate 12, and whose threaded ends screw into the face plate 11. It should be noted that the long screws 18 pass clear through the casing 13 which, in turn, is fastened to the wooden spacer block 14 by means of a plurality of wood screws 19. It should be observed at this time that the lock is tamper proof from both the inside and the outside, because neither face plate 11 nor 12 can be removed from its respective side of the door; first, because the face plate 11 on the inside of the door is firmly held in place by

machine screws 18 whose heads are on the other side of the door under the plate 12, and secondly, because plate 12 on the outside of the door is held in place by rivet head screws whose tightening nuts are on the inside of the door. Once the lock has been assembled, it is preferred that the ends of rivet head screws 15 which protrude through the nuts 16 be spread so as to prevent the removal of the nuts.

Each cylinder 8 and 9 is of the ordinary type having cooperating tumbler pins, not shown, and extending therefrom a plug 20. The plug 20 differs from the plugs used in ordinary key actuated pin tumbler cylinders in that the portion thereof near the cylinder is of square form while the portion thereof near the free end is round. The reason for this will appear later. The plugs 20 of the two cylinders 8 and 9 are arranged substantially coaxially in the same straight line and both project into a square tubular metallic element 21 which forms the shaft for the gear 10 to drive the same for moving the locking bars 4, 4 either toward or away from the keepers 3, 3 on the door frame 2. It will thus be seen that rotation of tubular element 21 will drive the gear 10 and control the movement of the locking bars. The square portions of the plugs 20 of the two cylinders 8 and 9 are designed to fit snugly into the interior of the tubular element 21 so that rotation of a plug 20 caused by the insertion of a key into a cylinder will cause rotation of the tubular element and movement of the locking mechanism. The tubular element 21, however, is made to have such a length that when one end of it is in cooperative relation with the square portion of one plug 20, the other end of the tubular element 21 will merely rotate on the smaller round portion of the other plug 20 and will be out of engagement with the square portion of the latter (note Fig. 5). It will thus be obvious that only one cylinder at a time can be used to actuate the locking bars 4, 4. A spiral spring 22 surrounds substantially the entire length of the tubular element 21 and has one end contacting a flange 23 on the tube and the other end contacting the gear 10, so as to normally cause the tube 21 to engage the square portion of the plug of the cylinder 9, whereby the outer cylinder is normally operatively associated with the locking mechanism (note Fig. 4). In order to disassociate the outer cylinder from the locking bars and to operatively associate the inner cylinder 8 with the locking mechanism, there is provided a lever 24 located underneath the cylinder 8 and which when pressed in the direction of the arrow shown in Fig. 4 will force the tubular element 21 against the tension of the spring 22, through the interior of the gear 10 and into operative engagement with the square portion of the plug of cylinder 8. Fig. 5 shows the locking bars operatively associated with inner cylinder 8. The lever 24, it should be noted, is pivoted at 25 and is provided with a fork or U-shaped end which engages the flange 23 of tube 21.

The cylinders 8 and 9 may be arranged to accommodate either a single key or different keys, as desired.

The lock shown in the present instance is particularly intended for loft and factory use, although not limited thereto, and possesses the important advantage of preventing an unauthorized person who has entered a factory from opening the door and departing with the contents of the factory.

What is claimed is:

1. In a lock having an inner side and an outer side, a key actuated mechanism on one side of the lock, a second key actuated mechanism on the other side of the lock, a locking bar normally controlled by one of said key actuated mechanisms, and means independent of said key actuated mechanisms for disassociating said locking bar from said one key actuated mechanism and for operatively associating said bar with the other key operated mechanism.

2. In a lock having an inner side and an outer side, a key actuated mechanism on one side of the lock, a second key actuated mechanism on the other side of the lock, a pair of oppositely disposed locking bars located between said mechanisms, a drive device for moving said bars simultaneously in opposite directions, means normally operatively associating said drive device with one of said key actuated mechanisms, and a lever for disassociating said drive device from said one key actuated mechanism and for operatively associating said drive device with said other key actuated mechanism.

3. In a lock having an inner side and an outer side, a pair of key actuated cylinders mounted on said sides of the lock, a plug for each cylinder, said plugs extending substantially in the same straight line, a bolt operating member, a drive device for said bolt operating member comprising a tube surrounding at least a portion of each of said plugs, and means including a manually operated lever for operatively associating said tube for engagement by only one plug at a time.

4. In a lock having an inner side and an outer side, a pair of key actuated cylinders mounted on said sides of the lock, a plug for each cylinder, said plugs extending substantially in the same straight line, a bolt operating member, a drive device for said bolt operating member comprising a tube surrounding at least a portion of each of said plugs, a spring normally forcing said tube into operative engagement with only one of said plugs at a time, and manually operated means independent of said cylinders for pressing said tube against the compression of said spring into operative engagement with said other plug.

5. In a lock having an inner side and an outer side, a pair of key actuated pin tumbler cylinders mounted on said sides of the lock, a plug for each cylinder rotatable in response to the rotation of a key inserted into its associated cylinder, a bolt operating member, a drive device for said bolt operating member comprising a hollow element surrounding at least a portion of each plug of said cylinders and adapted for operative engagement with said plugs, and means independent of said cylinders for disassociating said drive device from engagement with one of said plugs and for operatively associating said device with the other plug.

6. In a lock having an inner side and an outer side, a pair of key actuated cylinders mounted on said sides of the lock, a plug for each cylinder, said plugs extending substantially in the same straight line, each of said plugs having a portion of rectangular cross-section near to and attached to said cylinder, and a portion of smaller cross-sectional area at its free end, a bolt operating member, a drive device for said bolt operating member comprising a tube having a hollow interior of rectangular cross-section, said tube surrounding at least the major portion of smaller cross-sectional area of both plugs, resilient means normally forcing said tube into operative

relation with the rectangular portion of one of said plugs, and manual means for pressing said tube against the compression of said resilient means into operative relation with the rectangular portion of said other plug.

7. In a lock having an inner side and an outer side, a key actuated mechanism on one side of the lock, a second key actuated mechanism on the other side of the lock, a pair of flat bars disposed one above the other in substantially the same vertical plane extending from opposite sides of said lock, said bars each having racks at their adjacent ends, a gear located between said bars and engaging said racks for driving said bars simultaneously in opposite directions, a shaft for said gear, means normally operatively associating said shaft with one of said key actuated mechanisms, and pressure responsive means independent of said key actuated mechanisms for disassociating said shaft from said one key actuated mechanism and for operatively associating said shaft with said other key actuated mechanism.

8. In a lock having an inner side and an outer side, a pair of key actuated cylinders mounted on said sides of the lock, a plug for each cylinder, said plugs extending substantially in the same straight line, each of said plugs having a portion of rectangular cross-section near to and attached to said cylinder, and a portion of smaller cross-sectional area at its free end, a bolt operating member, a drive device for said bolt operating member comprising a tube having a hollow interior of rectangular cross-section, said tube surrounding at least the major portion of smaller cross-sectional area of both plugs, resilient means normally forcing said tube into operative relation with the rectangular portion of one of said plugs, and manual means for pressing said tube against the compression of said resilient means out of operative relation with said one plug and into operative relation with the rectangular portion of said other plug.

9. In a lock having an inner side and an outer side, a pair of key actuated cylinders mounted on said sides of the lock, a plug for each cylinder, said plugs extending substantially in the same straight line, each of said plugs having a portion of rectangular cross-section near to and attached to said cylinder, and a portion of smaller cross-sectional area at its free end, a bolt operating member, a drive device for said bolt operating member comprising a tube having a hollow interior of rectangular cross-section, said tube surrounding at least the major portion of smaller cross-sectional area of both plugs, resilient means normally forcing said tube into operative relation with the rectangular portion of one of said plugs, and a lever having a fork-shaped end engaging said tube and adapted to exert pressure against the same and against the compression of said resilient means for forcing said tube out of operative relation with said one plug and into operative relation with the rectangular portion of said other plug.

GAETANO FEDELE.