E. L. TEICH.

FIRE DOOR LOCK.

APPLICATION FILED JULY 14, 1919.

1,346,143.

Patented July 13, 1920.

3 SHEETS—SHEET 1.

Fig. 1.

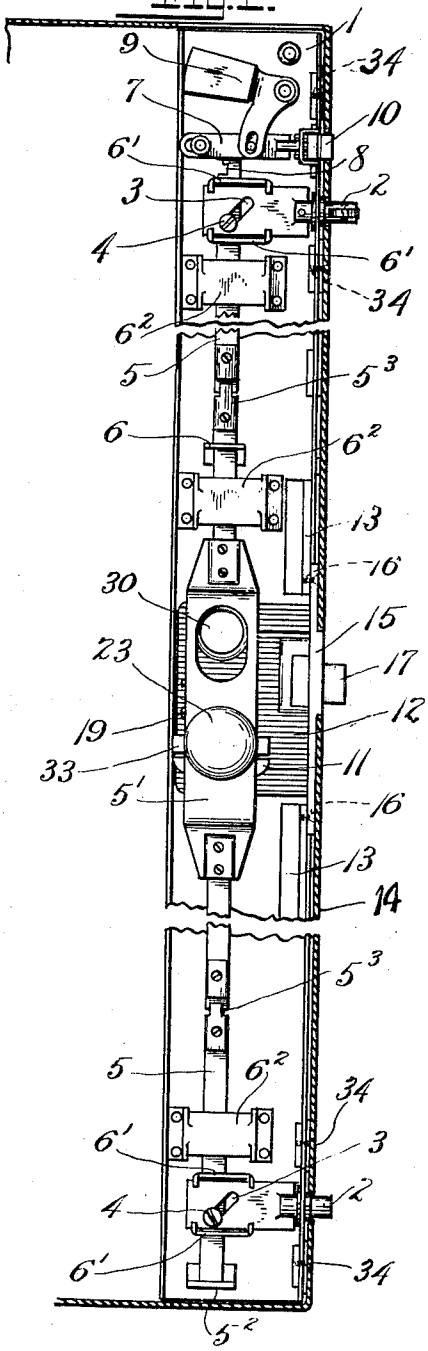
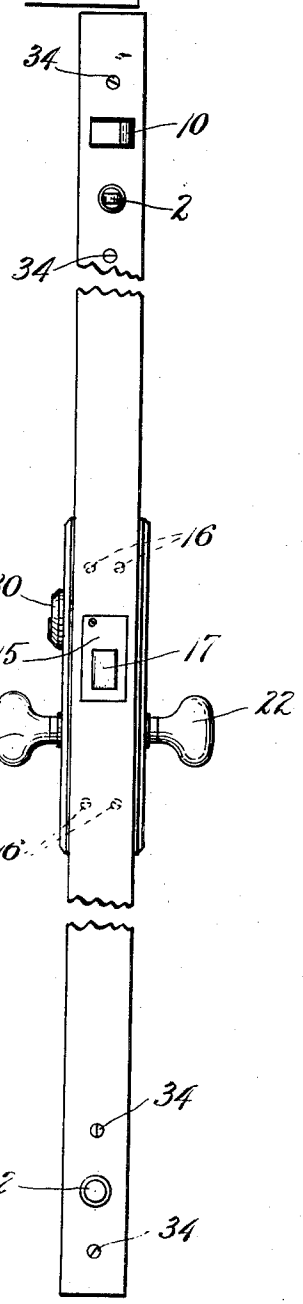


Fig. 2.



INVENTOR

E. L. Teich

BY

Bartlett & Brownell

ATTORNEYS

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3 SHEETS—SHEET 2.

Fig. 5.

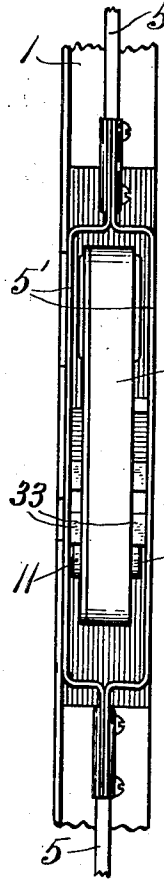


Fig. 3.

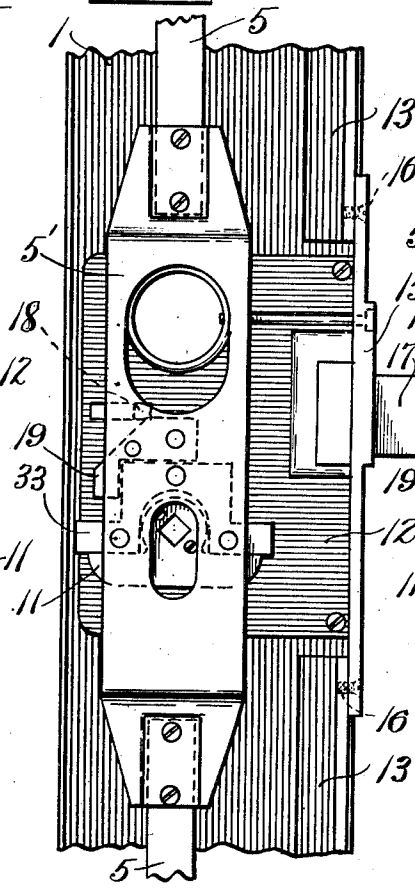


Fig. 4.

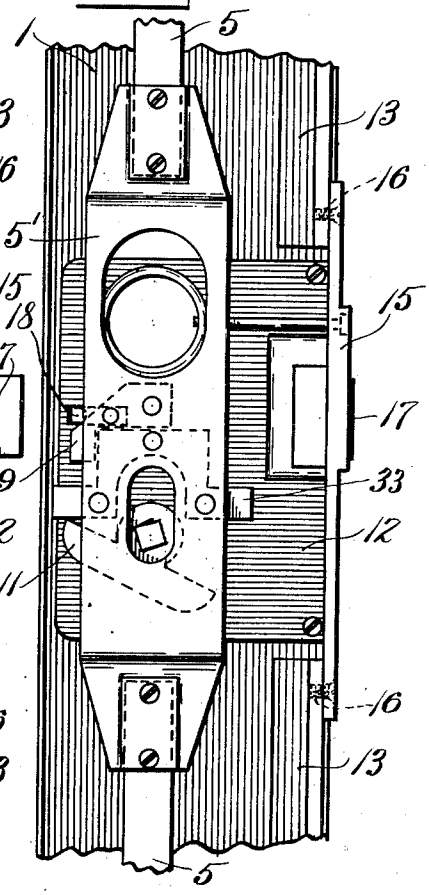


Fig. 6.

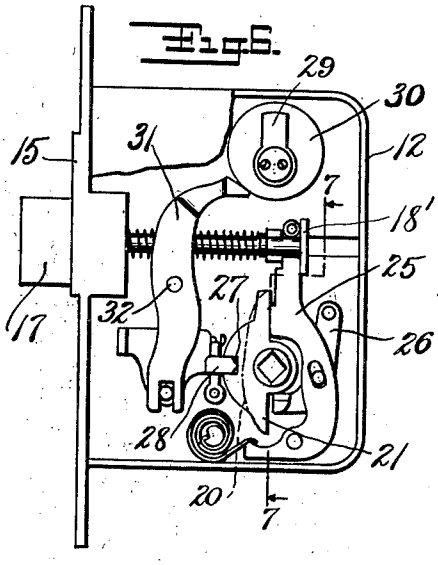


Fig. 7.

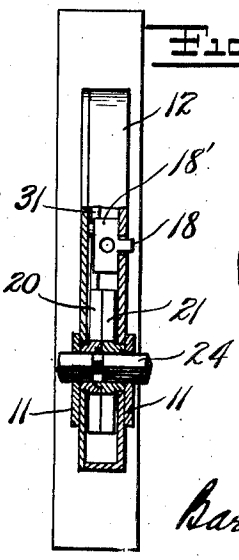
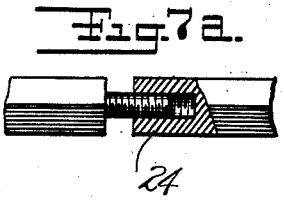


Fig. 7a.



INVENTOR

E. L. Teich

BY

Bartlett & Brownell

ATTORNEYS

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3 SHEETS—SHEET 3.

Fig. 8.

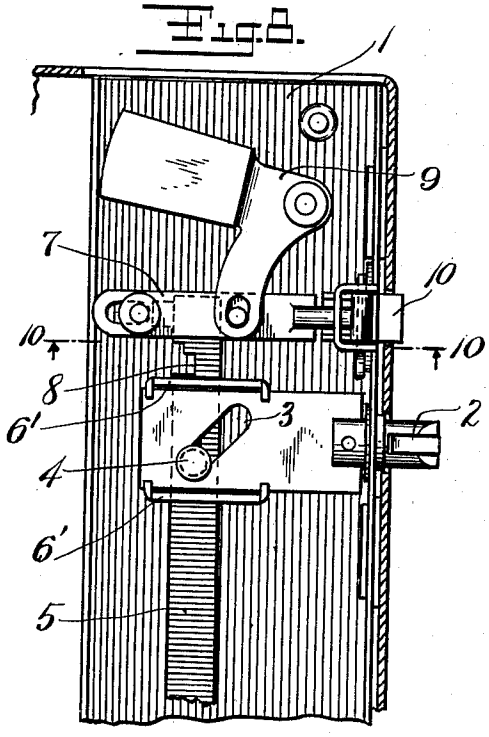


Fig. 9.

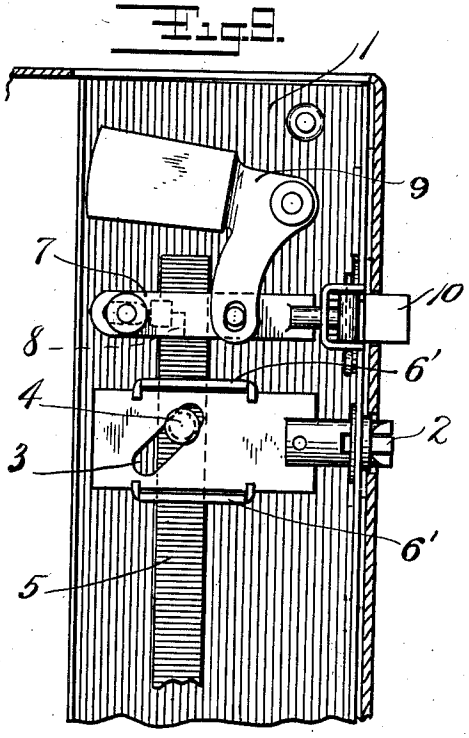


Fig. 11.

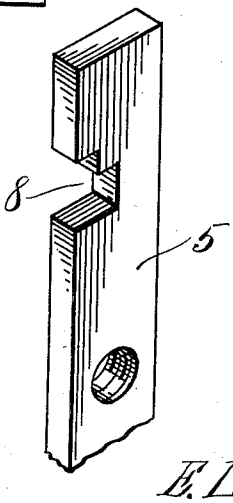
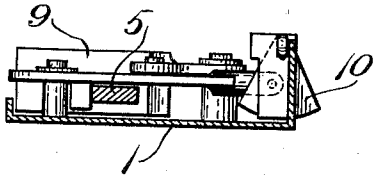


Fig. 10.



INVENTOR

E. L. Teich

BY

ATTORNEYS

UNITED STATES PATENT OFFICE.

ERNEST L. TEICH, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO THE AMERICAN HARDWARE CORPORATION, OF NEW BRITAIN, CONNECTICUT, A CORPORATION OF CONNECTICUT.

FIRE-DOOR LOCK.

1,346,143. Specification of Letters Patent. **Patented July 13, 1920.**

Application filed July 14, 1919. Serial No. 310,826.

To all whom it may concern:

Be it known that I, ERNEST L. TEICH, a citizen of the United States, residing at New Britain, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Fire-Door Locks, of which the following is a full, clear, and exact description.

My invention relates to improvements in fire-door locks and has for its object to provide a unitary lock for sheet metal fire-doors. It further has for its object to provide a lock for fire-doors in which the latch bolt of the mortise lock, as well as the other bolts, is held in retracted position when it has once been retracted and the door is open. One feature of my invention consists in securing a mortise lock to the frame of the fire-door lock prior to the insertion of the fire-door lock in the door and providing the sheet metal of the door with an opening for the latch bolt so small that a considerable portion of the face plate of the mortise lock is covered by the sheet metal of the door. Another feature consists in providing the latch bolt of the mortise lock with a projection and providing the bar for actuating the throw bolts with a cam coöperating therewith so that, when the bar is positively moved to retract the throw bolts and held in such moved position, the cam will act to hold the latch bolt retracted against the spring pressure of its projecting spring after the knob is released. Another feature of my invention consists in means for deadlocking a portion of the roll-back of the mortise lock so as to prevent said latch restraining cam from being set from the outside of the fire-door without interfering with the setting of the cam by the inside knob.

The following is a description of an embodiment of my invention, reference being had to the accompanying drawings, in which,

Figure 1 shows a side elevation of my fire-door installed in a sheet metal fire-door, the door being shown in section;

Fig. 2 is an end elevation of the door containing the fire-door lock;

Fig. 3 is an enlarged view of a portion of the fire-door lock containing the mortise lock with the parts in normal position;

Fig. 4 is a similar view showing one of the roll-backs in position to raise the bar for actuating the throw bolts;

Fig. 5 is a rear elevation of the parts shown in Fig. 3;

Fig. 6 shows the interior of the mortise lock, the front plate and one of the roll-backs carried thereby being removed;

Fig. 7 is a section on the line 7—7, Fig. 6;

Fig. 7^a is the swiveled spindle of the lock of Fig. 2;

Fig. 8 is an enlarged view of the upper portion of the fire-door lock with the parts in normal position;

Fig. 9 is a view of the similar parts with the actuating bar held in elevated position by its detent;

Fig. 10 is a section on the line 10—10, Fig. 8, and

Fig. 11 is an enlarged detail view of the upper portion of the actuating bar.

Referring more particularly to the drawings, 1 is an angle-plate on which are mounted throw-bolts 2—2, having cam slots 3 in which are pins 4 carried by the vertical bar 5 mounted to move in guides 6—6′. The bar 5 has a frame made up of members 5′ surrounding a mortise lock. 5^2 is a stop engaged by the lower end of the bar 5. 5^3 are universal connections in the bar 5. 6^2 are spacers. 7 is a detent adapted to engage the steps of a stepped notch 8 in the bar 5 and hold the same in elevated position when the door is open, said detent being moved toward looking position by the weighted bell-crank lever 9. 10 is a cam pivoted to the angle-plate and pivotally connected to the detent and adapted to engage the door jamb so that when the door is being closed the detent is released from the bar so as to permit the bar to fall and project the throw-bolts on account of the cam action of the slots and pins. The bar is actuated by the external roll-backs 11 on a mortise lock 12 so as to cause it to rise. The mechanism thus far described is substantially that described in Patent No. 1,094,962, Arens and Fletcher, dated April 28, 1914.

In the device of the patent above referred to, the mortise lock was secured in position after the angle-plate and throw bolts had been secured within the door. This was found to be objectionable on account of the liability to faulty assembling and, furthermore, the face-plate of the mortise lock being entirely exposed and the mortise lock being removable, it was liable to be removed and either incorrectly re-assembled or left

removed, in which case it would be impossible to retract the throw bolts when occasion arose. In order to insure the proper assembling of the elements of the fire-door lock, and to prevent the removal of the mortise lock after the fire-door lock had been installed, I secure a mortise lock 12 to the angle-irons 13 on angle-plate 1 of the fire-door lock so as to produce a unitary structure and then extend the metal of the sheet metal fire-door 14 until only a small portion 15 of the face-plate of the mortise lock is exposed, thus covering the securing screws 16 of the face-plate and preventing the removal of the mortise lock as well as doing away with the danger of an incorrect assembling of the mortise lock and other portions carried by the angle-plate. The exposed portion 15 of the face-plate is brought flush with the surface of the edge of the door.

When the fire-door is open, the throw-bolts 2 are held retracted by the detent 7 acting on the bar 5 so as to make it easy to shut the door and upon the closing of the door they are released so as to enter the jamb of the door and hold the door closed, thus making it an easy matter to close the door.

The door is liable to be slammed closed, and in slamming the door a protruding latch-bolt in the mortise lock is liable to interfere with its sudden closing. I have devised a means for holding the latch-bolt 17 of the mortise lock retracted whenever the throw bolts 2 are held in retracted position and for releasing it when the throw bolts are released. This means consists of a projection 18 on the plate 18′, which I have provided on the end plate of the latch, the same projecting through the casing of the mortise lock, and a cam 19 carried by the bar for actuating the throw bolts. This cam is so disposed with relation to said projection 18 that when the latch-bolt 17 is retracted and the bar 5 is held in elevated position by the detent 7, the latch-bolt 17 will be held in retracted position by the engagement of the cam with said projection. This cam 19 holds the latch-bolt 17 retracted to the same degree that the throw bolts 2 are held retracted according to which step of the notch 8 is engaged by the detent 7.

The mortise lock is provided with a roll-back, divided into two parts 20, 21, and the knobs 22, 23 of the lock are provided with a swiveled spindle 24 so that each knob actuates but one-half of the divided roll-back, both halves bearing against levers 25 and 26 for retracting the latch-bolt. One of the roll-back sections is provided with a recess 27 with which coöperates a sliding bolt 28 which is actuated by the cam 29 of a cylinder lock 30 through a lever 31 pivoted at 32, so that by turning the cam 29 by means of the lock key, the outer roll-back section 21 can be deadlocked by throwing the bolt 28. Each roll-back section has connected to it an external roll-back 11 which engages one of the abutments 33 upon the actuating bar 5 so as to raise the bar when either part of the roll-back section 20, 21 is actuated by its knob. The part of the internal roll-back 21 on the same side as the cylinder lock 30, however, can be deadlocked by the bolt 28 so as to prevent the cam 19 restraining the latch-bolt from being set from the outside of the door when desired, while being free to be raised by the inside knob so as to be moved into latch-restraining position when desired. By this means the fire-door lock can be adjusted by the inside knob when the door is open so that both the throw bolts and the latch-bolt are retracted, although the internal roll-back on the side nearest the cylinder lock is deadlocked; so that the fire-door can be closed from either the inside or the outside, without the retraction of any bolt, and when so closed is locked against opening from the outside, except by a suitable key for the cylinder lock, although it can be opened by the inside knob so as to set both the throw bolts and latch-bolt in retracted position. The fire-door lock is installed as a unitary structure and is held in place by screws 34 passing through the sheet metal of the door and into angle-irons on the angle-plate 1.

As will be evident to those skilled in the art, my invention permits of various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. In a fire door lock, the combination of an angle-plate, throw bolts carried thereby, a mortise lock also carried thereby, knobs for actuating the latch of said mortise lock and said throw bolts, and a sheet metal door within which said angle-plate and mortise lock are located, the metal of said door extending partially over the face-plate of said mortise lock, said face plate having a projection which surrounds the latch bolt of said mortise lock, extending through the edge of said door and flush with the outer surface thereof.

2. In a fire door lock, the combination of an angle-plate, throw bolts carried thereby, a bar for actuating said throw bolts, a mortise lock also carried thereby, knobs for actuating the latch of said mortise lock and elevating said bar, the latch bolt of said mortise lock having a lateral projection extending through the mortise lock casing, and a cam on said bar engaging said projection so as to hold said latch bolt retracted when said actuating bar is in elevated position.

3. In a fire door lock, the combination

of an angle-plate, throw bolts carried thereby, a bar for actuating said throw bolts, a mortise lock also carried thereby, knobs for actuating the latch of said mortise lock and elevating said bar simultaneously, the latch bolt of said mortise lock having a lateral projection extending through the casing of said mortise lock, and the bar for actuating said throw-bolts having a cam engaging said projection so as to hold said latch bolt retracted when said actuating bar is in elevated position, said mortise lock having a divided roll-back, each member of which is adapted to act to retract said latch bolt, a swiveled spindle therefor, and means for deadlocking one part of said divided roll-back.

ERNEST L. TEICH.